E. M. Baker

The Monthly Review of the AMERICAN ELECTROPLATERS' SOCIETY

CONTENTS

The Boston Convention 431

President Candee's Message 434

Stratton—The Effect of Priorities on the Metal Industry 437

Loeserman—Coatings for Electroplated Ware 449

Mattacotti—Copper and Tin 457

New York Branch Honors One of Her Favorite Sons (Reprinted from *Metal Finishing*, June, 1941) 462

Branch News 466

The Question Box 488

Membership Report 492

Membership Report, 1940 - 1941 498

Index to Advertisers 500

Buyers' Guide 504

Branch Directory 508

JUNE 1941

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The Boston Convention

Those of us who prophesied that the attendance and enthusiasm at this year's A.E.S. Convention in Boston would be at low ebb, are now rather perplexed at our inability to forsee things correctly. From every branch in the Society and every place where plating is done in volume, our members came with one single purpose. That purpose was to find out all they could about the future of plating, and the use of substitutes for the standard finishes so long produced before the era of priorities and government regulation of metals, and they were not disappointed.

Dr. Stratton's address at the opening session of the convention should be read by everyone connected with the industry. It is not pleasant reading and was not intended as such. It is straight from the shoulder, told by an OPM man who knows his subject and who expressed regret that his audience was obliged to listen to the bare facts he presented without much hope of conditions being improved in the near future. As a token of patriotism and respect for the message delivered, the entire convention arose and applauded the speaker for his forceful address. It is published in this issue of the REVIEW for the benefit of all, members and non-members alike.

We cannot do justice to the convention activities in the space allotted. Suffice it to say that from every angle, it was the greatest convention the A.E.S. ever held. We had a record-breaking attendance; the Educational Sessions drew large crowds from Monday morning until the final meeting on Thursday. The discussions of the papers read were spirited and interesting. The social activities including the places of historic value that were visited and the plant visitations all contributed to the success of the event. The weather, in keeping with the spirit of the crowd, was ideal from start to finish. The ladies, approximately 200, were lavishly entertained by Ann Baker and her committee. Her work alone in this respect was outstanding, to say nothing of the planning of the entire program by Joe Barron and his loyal helpers, the members of the Convention Committee. In extending to them our most sincere thanks,

may we say that they have set a mark for future conventions that will be hard to beat. The total registration was 718.

By way of appreciation, may we mention also the splendid group of authors whose labor in preparing and presenting papers of such educational value made the 1941 meetings so successful. The business meetings, too, were well attended. Ellsworth T. Candee of Waterbury, Conn., was elected president, Charles C. Conley of Dayton, first vice-president, George Wagner of Newark, second vice-president, and Maurice Caldwell of Grand Rapids, third vice-president. Grand Rapids was chosen as the meeting place for the 1942 Convention.

Two Honorary Members to the Supreme Society were elected, Mr. George Gehling of Philadelphia and Mr. Ernest Lamoureaux of Los Angeles. Mr. John Merigold drove all the way from Los Angeles to represent his branch and incidentally, to carry back with him the silver plaque which was presented to the branch having the largest membership increase during the year.

The Papers Awards Committee, consisting of Maurice Caldwell, Grand Rapids, J. E. Fritts, Detroit, E. Hohn, Detroit, and Ernie Beightol, Detroit, with Gustaf Soderberg as Chairman made the following awards: THE FOUNDER'S GOLD MEDAL to B. E. Lewis, Detroit Branch, for his paper. "The Relationship of Cleaning Techniques and Adhesion of Electrodeposits." THE A.E.S. GOLD MEDAL to W. L. Pinner, Detroit, for his paper, "The Effects of Base Metal Polishing on the Character of Nickel Plate." 50 Dollars Award, for best paper published in the REVIEW, was presented to R. M. Wagner of Anderson, for his paper, "National Defense and the Electroplating Industry."

Dr. M. M. Beckwith, Anderson Branch, received the PROCTOR MEMORIAL AWARD of $100 in memory of the late Mrs. Proctor. Honorable mention was given to Messrs. E. H. Lyons of Chicago, Drs. Faust and Pray of Columbus, Ohio, Dr. A. Brenner, Washington, D. C., and Dr. A. S. Gray of Wilmington, Del. The decision regarding the Samuel Heuerfauth Cup for the best branch paper presented was given to Toledo Branch.

The exhibit awards are as follows: Metal Industry Cup presented to Chicago Branch; 1st Certificate to Arthur Logozzo, Springfield Branch; 2nd Certificate to Arthur Mintie, Boston Branch; 3rd Certificate to Clarence Robinson, Grand Rapids Branch. The committee was as follows: Arthur Mintie, Austin Fletcher, Robert Goodsell, Gaston Bergeman.

The baseball game between East and West was "a honey," the final score being East 22, West 16. Captains were East,

Dr. Young; West, Rudy Hazucha and Frank Savage. Dave Clarin umpired, assisted by "Cyanide" Bill Schneider. Silver baseballs were given to the losers and gold ones to the winners.

Seven hundred and fifty-seven guests sat down to the banquet on Thursday evening and enjoyed one of the greatest shows ever given before an A.E.S. audience. Every act drew rounds of applause from the audience every one of whom stayed through the entire performance.

All five chairmen of the Educational Sessions, Jack Costigan, Ross Lyons, Walter Meyer, W. M. Phillips, and Charlie McGinley did a nice job as presiding officers. Fred Fulforth, the retiring President also deserves plenty of commendation for the way he handled the business sessions.

Dick Crane, of the Lea Mfg. Co., Waturbury, was elected Chairman of the International Fellowship Club for 1941-42. Waterbury now has the distinction of having two of her native sons honored, Ellsworth Candee being the new President of the A.E.S. The inscription under the miniature nickel anode attached to the Detroit exhibit tickled our fancy. It read—"This is a nickel anode. Detroit was at one time infested by thousands of these species which is now practically extinct." Freddie Gumm's lunch at the Whiting and Davis Plant at Plainville, Mass., was attended by approximately 350 men. Our thanks are extended to the Gumm Company for their fine cooperation.

We wish to acknowledge with thanks the Hanson-VanWinkle-Munning official Convention News, which appeared before breakfast every morning. The news items, personal interest paragraphs, and program of events for the day were interesting and helpful. Weren't the official badges beautiful? Especially the ladies decorations. And how about the mesh bags that were given to the fair sex with the A.E.S. Insignia? They too will be treasured until George Hogaboom collects some of them for his museum. We must not forget the International Fellowship Club's luncheon on Monday night. It was a grand success, presided over by Tommy Trumbour. Aunt Ella's party on Wednesday for the ladies was also much appreciated. Dave Clarin was responsible for the success of this event. Some good singers amongst the ladies, eh Dave?

When the orchestra started to play "God Save the King," in honor of our Canadian members and friends at the banquet, John Feeley of Montreal let it be known where he was from. John's allegiance to the A.E.S. is well known too. Lou Hague, President of Hanson-VanWinkle-Munning Company made quite a hit as a dispenser of gifts at the Banquet. We bet many

of the diners envied Mrs. Ray O'Connor as she brought home the silver service set. Congratulations, Mrs. O'Connor.

Well, we could go on and on, but must stop. Let us all turn our eyes toward Grand Rapids in 1942. They have a fine group of men there. They have enthusiasm, talent and a willingness to work. Let's back Chet Smith and Maurice Caldwell to the limit. Remember also the new officers of the A.E.S. They too need our support. Don't let your enthusiasm wane because the Convention is over. The year ahead is not too promising but we have been through perilous times before. Let's remember we've just had the best Convention in our history. We can make the Grand Rapids meeting even better with your cooperation and support.

PRESIDENT CANDEE'S MESSAGE

I want to thank all of my friends who have had confidence enough in me to elect me President of the American Electroplaters' Society. Although I am justly proud of the honor that is attendant on the office of president, I must admit that I look upon my new responsibility as one which will require continuous effort in order to serve our members and our industry in more drastic times than we have ever known before. I feel that the coming year will bring even greater changes in our requirements —greater necessity for attention to our responsibilities.

The Society is growing rapidly and as it grows the duties of the officers must necessarily expand. It is self evident that in these abnormal times the responsibilities of the officers must be vigorously performed if they are to serve the industry to the best advantage. At the executive meeting Friday morning after the final business meeting of the convention, the following duties were assigned to the vice-presidents:

Mr. Charles C. Conley, First Vice-President — Educational Program.
Mr. George Wagner, Second Vice-President — Exhibits
Mr. Maurice R. Caldwell, Third Vice-President —Membership.

Those of us who were at the Boston Convention heard Dr. Samuel Stratton's talk on the metal situation. His complete paper is published in this issue of the "MONTHLY REVIEW." The outlook he gave us was very dark and depressing, to be sure, and he was not able to hold out much hope for the future. There is no reason to believe that Dr. Stratton made the situation seem unduly depressing and it would be well for us to accept these facts and make our plans accordingly.

Dr. Blum, in the Monday afternoon Educational Session, gave the other side of the picture on what can be done in substituting one plated finish for another to partially offset the shortage in metals. The substitutions which Dr. Blum offered for consideration concerned the substitution of one metal for another and would probably only offer temporary relief. All metals are being required in ever increasing quantities for National Defense and if too many people substitute one metal for another there will eventually be a shortage of all metals. It would, therefore, seem that the finishing industry will be forced to use other methods of finishing which do not require metals and that all members of the A. E. S. will need to have available the largest fund of knowledge possible on these substitute finishes.

ELLSWORTH T. CANDEE
New President of the A. E. S.

With this in mind I would recommend to every Branch Librarian that educational programs be prepared for the coming year which will assist the members on the substitution of finishes available which do not require the use of metal. The Librarian should also prepare programs which will show the results of these substituted finishes on serviceability; how they may be applied

with the equipment available in the Finishing Departments, etc. Mr. Conley, First Vice-President, is collecting a list of speakers available and the librarians are urged to use this list freely and assist Mr. Conley in making the list as complete and diversified as possible.

From the foregoing, it will be plain that the branch programs should necessarily change from purely plating subjects to the broader subject of finishing. These should include finishing by the application of oxide coatings, such as are applied to aluminum and magnesium; the application of enamel and lacquer finishes which will be substituted for electroplated finishes and the substitution of one metal for another where possible. In other words, as a result of the very nature of the problems of our members we will gradually become The American Society for Finishing rather than The American Electroplaters' Society.

Although this broadening of the Society's field of interest may be brought up as an emergency feature because of National Defense, it will very probably result in a permanent broadening of the base purpose of the Society since a large portion of our members even today are in charge of finishing departments as a whole rather than in charge of only the plating room proper. There is no conflict between the narrower electroplating field and the broader field just mentioned. The change will be one of natural growth which is merely hastened by the present emergency.

Let no one think that plating will be an obsolete science or that plating will not be required for the duration of the emergency. The fact is that the amount of plating will increase along with other types of work for National Defense but the types and functions of plating will be different from the usual decorative finishes with which we are familiar. The science of electroplating has progressed very rapidly in recent years and the rate of progress has not slackened. This is well shown by the papers presented at Branch meetings and at the Boston Convention. Research in electroplating will be continued more actively than ever in the next few years although the efforts will be directed more towards the needs of National Defense than to the normal functions of plating.

The Executive Committee is well distributed geographically so that it should be possible to have some member visit most of the Branches during the year. This Committee is at the service of the Society and will help in any way possible. They will welcome your requests and suggestions. Speaking for myself, the office of president will be used to continue the growth and prestige of the A. E. S. with due attention to our increased opportunities and responsibilities.

The Effect *of* Priorities *on the* Metal Industry

Address before the A. E. S. Convention
Boston, Mass., June 9, 1941, by
DR. SAMUEL S. STRATTON
OPM, Washington, D. C.

BY definition, priority means giving preference in delivery to those customers whose needs for material or equipment can be identified with defense contracts or subcontracts. By implication it can be seen that if the supply of a material is inadequate to take care of all defense orders and of civilian orders, then the defense needs must be supplied at the expense of the non-defense customers. It must appear reasonable to you that in depriving non-defense customers of a scarce material, it is the government's duty to see that luxury and non-essential industries give up such materials before public utilities and essential industries are placed under rationing.

For example, in April the supply of aluminum was adequate for all defense needs and for all the requirements for essential industry and public health. It was not adequate to fill the entire demands for luxury and non-essential uses. Hence, for April, the Priorities Division restricted the sale of aluminum for such non-essential uses to a certain percentage of the consumption for the same uses in 1940. For June, the supply of aluminum, because of the increase in defense requirements, will not be sufficient to make possible any allocation of any of the primary metals to the non-essential uses. That is a simple fact to state. Likewise, the arithmetic on which the statement is based is not difficult to grasp. We know within a reasonable margin of error how many pounds of aluminum will be produced in June. We know again, within a reasonable margin, what the requirements for aluminum for defense and for industries essential to defense and to public health will be. In round figures, the quantities are about equal. Hence, the simple statement that there will be no primary aluminum sold for luxury or non-essential uses this June.

Despite the simplicity of this statement, you are keenly aware, and so are we in the Priorities Division, of the impact of this

simple fact on whole segments of our economy. You know that sincere and competent American businessmen have labored and sacrificed to build up successful businesses that serve luxury and non-essential needs. Indeed, in this country we have always boasted of our richness and of the high standard of living which we enjoy. We are proud of our aluminum coffee-pots. Yet, by our priority orders we may be forced to check the growth, or even destroy, these non-essential businesses until such time as substitute raw materials can be used by them.

In short, priority orders are intended to interfere with business as usual, and hence such orders impose hardships. They may force the use of substitutes in instances where companies and industries have spent great sums of money in developing markets for their products. (That is particularly true in the case of nickel. International Nickel over a space of years, spent great sums of money building up markets for nickel, which markets are now being curtailed.) They may also force suppliers to cut off or curtail shipments to some of their best customers if these customers are not engaged in defense work. (There is not a day goes by but what we run into the situation of some non-defense customer who has been the bread and butter and good customer of certain industries producing these scarce materials and naturally the producer is loath to cut off his best customer.) Priority orders may force certain industrial consumers to curtail operations with consequent loss of profits and loss of skilled workers whom they have trained at considerable expense. Priorities may for interim periods cause unemployment for workers in non-defense industries.

Businessmen may properly ask, "What, if anything, are we doing in Washington to minimize the shock administered to non-defense industries by the imposition of priorities?" I think it is proper for me to state that we are making every effort to facilitate business adjustment to the new era in which we find ourselves. For example: For several weeks there has been in existence a Defense Contracts Service with many field offices scattered about the country. It is the function of this service to enable manufacturers to find defense contracts and to convert their facilities from the manufacturer of non-essential items to materials and equipment for defense. More recently, the

section of conservation and substitution was created in the Production Division of OPM. This office makes every effort to help producers to find ways and means for conserving scarce materials and for substituting more plentiful materials in their manufacturing operations. From the Labor side, the Labor Department of OPM attempts to reallocate workers and to retrain them for defense jobs. In the Minerals and Metals Division of Priorities we have attempted to stop hoarding of scarce materials by issuing an Order which we call "General Metals Order No. 1." To the extent that we can prevent unnecessary hoarding of materials we shall, of course, free these materials for both defense and non-defense uses.

There is, of course, the old saying, "You can lead a horse to water, but you can't make him drink." And so in many instances we find manufacturers who have never desired to take on defense orders, and have found it too expensive and too much of a nuisance to attempt to use substitute materials. Such manufacturers, if they are in luxury lines using scarce materials, may find it necessary to go out of business. But we have groups of manufacturers coming to Washington, within a given trade or industry . . . some, who all summer have been planning to use substitutes for things now designed out of these scarce products, making use of substitutes; others who started hurrying around getting defense business weeks ago . . . and both of these groups are relatively well off. You will find within the same industry, making the same product, whatever it may be, certain manufacturers who have neither tried to find substitutes nor to get defense business and they are the ones who now, unfortunately, are in a very bad way.

Businessmen frequently say that they are mostly concerned about the uncertainty of getting supplies. It is sometimes stated to us that once a manufacturer knows that he can get no more of a certain material, or that he may expect a certain minimum amount, then he can plan his operations accordingly. In the Priorities Division, we define an optimist as the man who thinks the future is *uncertain*. To us, it seems certain that defense requirements will increase and will increase faster than supplies of scarce materials can be augmented. In short, I should venture to say, to any user of aluminum, nickel, or mag-

nesium; of alloy steels, tungsten, or ferro-chrome; of copper, zinc, or brass, that whatever quantity of these materials he is now obtaining for use in luxury and non-essential industries, such quantities will be substantially reduced in the months ahead.

I would say further, and as my own opinion, that absorption of such materials for defense is not a matter of months, but of years. Let me support my statement by a few figures.

At present, we are spending approximately one billion dollars a month for defense. This is at the rate of twelve billion dollars a year. But we have already appropriated forty-one billion dollars for defense, and it is planned to spend these appropriations at the rate of two billion dollars a month before many months have passed. In short, we hope soon to more than double our monthly expenditure for defense, and it would seem reasonable to assume that with this increased rate of expenditure the demand for the materials which I have mentioned will increase proportionately. Furthermore, if the rate of expenditure on defense does not go higher than two billion dollars per month, it will take one and one-half years to spend the forty-one billion dollars already appropriated. But under the Lend-Lease Act, and under our commitment to make this country impregnable, the appropriations and expenditures for defense are bound to increase beyond the forty-one billion dollar figure I have mentioned.

Germany spends perhaps 85 percent of her national income on armament; Britain is spending about half of her income on the war effort. We, at present, are spending probably not over 10 percent of our national income on defense. Putting it another way, it is estimated that the Germans are expending at least two billion dollars a month on war effort. The British expenditures total about one billion dollars per month. Hence, if we are merely to equal the German war effort measured in terms of dollars, we must produce and ship to Britain one billion dollars worth of war materials per month, in addition to our production of ships and planes and war materials for our own Army and Navy defense requirements. In short, these facts seem to indicate further shortages for critical and strategic materials for a long time to come. I see nothing to be gained by refusing to face these facts.

Of chief interest to electroplaters is the situation with regard to nickel and copper. Nickel was first brought under mandatory priority control early in March. On May 19, the earlier regulations for priority control of nickel were superseded by General Preference Order No. M-6, and nickel is now being controlled by the Priorities Division of OPM under this order. Very briefly, the Order makes it mandatory for producers of nickel to give preference in deliveries to defense orders. For the administration of this General Preference Order, all customers for primary nickel must file certain information with the Director of Priorities. It is the intent of this questionnaire to ascertain the quantities of nickel which the customer requires, and the product or products which are to be made from such nickel, and the uses to which such products will be put. Once this information is assembled, it is possible to ascertain the quantity of nickel demanded for defense purposes for essential industries and for non-essential or luxury uses.

The Priorities Division then gives instructions to the nickel producers to make shipments in such manner that all defense requirements will be fulfilled. To the extent that there is nickel available after defense orders have been filled, the Director of Priorities gives instructions for the disposition of such excess of nickel, giving preference, of course, to essential uses. The following figures may be of interest: In March, 1941, the demand for nickel in this country was approximately twenty million five hundred thousand pounds. In May, the demand had increased to twenty-one million six hundred thousand pounds. Of these requirements, twelve million one hundred thousand pounds were for defense orders in both March and May. Against this total demand of approximately twenty-one and-a-half million pounds there was available for shipment in this country about fifteen million pounds in May.

In short, after defense needs were taken care of, only three million pounds of nickel were available to meet demands for non-defense needs of approximately eight million pounds. On this basis, it will be seen that non-defense needs could be supplied only to the extent of 40 percent of the demand in the month of May.

Here are some figures on the electroplating industry. In

April, 965,695 pounds of nickel were requested — that is, placed on order for the automotive industry. 80 percent of that amount, or 781,000 pounds, was requested for nickel plating, 19 percent was requested by the steel mills for nickel steels for the automotive industry. The total automotive plating requirements of 781,000 pounds in April were 53 percent of the total nickel requirements of electroplaters in the United States in that month. The requirements of 781,000 pounds which were asked for by the plating industry for automotive plating requirements equalled 126 percent of the amount actually allocated in April in the entire plating industry for all requirements. You may be familiar with those figures — I have lots more of them.

The impact of the defense program on nickel requirements is clearly brought out when we note that average monthly shipments of nickel in the United States for the year 1939 amounted to only approximately 8½ million pounds; whereas in May, 1941, shipments approximated 15 million pounds and customers' demands for nickel in May, 1941, were approximately 22 million pounds. On the basis of industry consumption of nickel, the largest increase, of course, has been in the steel industry. Steel mills consumed about 46 percent of total nickel consumption in the United States in 1939, whereas in May, 1941, steel mills took about 63 percent of the total output of nickel. The electroplaters, on the other hand, consumed about 13 percent of the total 1937 consumption of nickel; whereas in May, 1941, electroplaters took about 4 percent of the total May production. From the point of view of the electroplating industry, the situation for June is even less encouraging as the following figures will indicate:

I have not the final figures on that, but tentatively, it looks like this: The supply of nickel available to the United States in June will be about 15½ million pounds and the defense requirements which as you remember in April were something around 12 million, are now 14,700,000 pounds which leaves less than one million pounds available for all defense uses, including electroplaters' uses.

It is obvious that the quantity of nickel allocated to electroplaters in the United States in June will be less than the quantity allocated in the past.

Obviously the only hope of increasing the quantity of nickel

that can be diverted into non-defense uses would be an increase in the total supply of nickel available for the United States. The supply of primary nickel to the United States comes, of course, almost entirely from Canadian production, and at present, this country receives approximately 70 percent of the total production of nickel in the British Empire. Because of British and Canadian requirements for defense, it is impossible to count on this country's receiving a larger percentage of the supply of Canadian and Empire nickel produced. Steps are now being taken, however, to expand the capacity for producing nickel in Canada, but it is estimated that over a year will elapse before the additional facilities can be built. In short, what I have said about nickel can be summed up in a sentence. Defense demands will continue to increase, while it is impossible to expect any increase in the supply available to this country within the next year or year-and-a-half.

Let us look at the situation with regard to copper. Two months ago, it was being confidently forecast that there would be adequate supplies of copper for all defense and civilian requirements. Today, we know that the demand for copper is greatly in excess of the supply available for both defense and civilian uses. In May, the Metals Reserve Corporation, which, as you know, has been importing South American copper, received applications for approximately 160,000 tons of copper, against its supply of approximately 40,000 tons, which it had brought up from South America. Requests for allocations of copper from the Metals Reserve Company come from users who cannot get adequate quantities of copper from their normal sources of supply.

On that basis alone, you would say that in May we were short over 100,000 tons of copper for civilian and defense uses. Obviously, we have some reason to believe, human nature being human nature, that some of the requests were perhaps in excess of what the people could actually have used in the month of May. Nevertheless, because of that situation and taking the figures on their face value, we a week ago placed copper under a Mandatory Priority Order and under this Order, the Priorities Division has taken over the South American copper purchased by the Metals Reserve Company and, in addition, has created a pool by instructing copper producers to hold back 20 percent of

their shipments. This pool of foreign and domestic copper for June amounts to approximately 57,000 tons, and it will be allocated by the Priorities Division for defense and essential uses. It is only fair to state that the shortage of ships may curtail the imports of copper from South America, and if that should turn out to be the fact, we shall get less copper per month from South America.

Production of domestic copper could, of course, be increased but only by making use of mines which cannot now produce economically at present copper prices. (I have also discussed that with various people who know much more about that situation than I do . . . some people seem to think that if something could be done to permit a higher selling price for copper, that some of these marginal domestic mines, might increase their output. Other experts in this field, including the men in the business, claim that a higher price would not really stimulate any great production of copper, because the higher price would probably be absorbed by higher costs and you would just be in a circle.

From experience, we have found in the Priorities Division that it is dangerous to forecast that one metal may be more plentiful than another. But, at present, despite the facts I have stated, there will presumably be more copper available for industrial uses than can be the case in nickel. Nevertheless, I should most certainly not wish to go on record as advising that in the months to come there will be copper available for completely non-essential and luxury uses.

I doubt if it is necessary to convince anyone at this gathering that this country must mobilize for an all out effort. Nevertheless, there are a great many sincere American citizens who do need to be convinced of the serious threat which daily grows more ominous. A month ago we received a great many sincere letters every day showing the poor attitude of many people in this country; but I will say that now we very infrequently see this type of letter. Those were sincere letters. We used to get dozens of them; we don't any longer because it is becoming more and more obvious than ever when these things do disturb our daily bread and butter, etc., we are in an all out program in defense of democracy; or, we cannot have our cake and eat it, too.

We are not engaged on a glorified WPA program. We must

keep the fortress of Great Britain intact, or the so-called wave of the future will sweep the Atlantic to our very shores. We must produce and we must deliver the goods that will hold and eventually conquer the sworn and avowed enemies of our democracy. We want no "new order" of the Hitler variety over here. We like the new order which our forefathers created in 1776 — a new order that stood and still stands for freedom, for freedom from fear, from subservience — a new order that stood and still stands for individual liberty and opportunity — a new order that stood and still stands for ever-increasing standards of living for all the people. A new order that has been under constant improvement during the less than 200 years of its existence.

We started the wave of the future in 1776, and we propose that it shall continue to go on. Totalitarianism is not a wave of the future — it is a cesspool of the past. But words will not defend us. We have appropriated 40 billion dollars for defense. But dollars will not save us. Guns and planes, bombers and tanks delivered to the places where they can be used; these alone will stop the greatest military machine the world has ever known.

It is now commonplace that the present war is a war of materials. We, of course, are not at war, but we have committed ourselves to become the arsenal of those democracies who have pledged themselves to defeat Nazi-ism. If the United States of America is to keep its solemn promises, we must divert our steel, our copper, our nickel, our tungsten, and ferrous alloys into defense uses. The Director of Priorities, and all those associated with him have a single, determined purpose — to strive always to provide the defense industries of this country with adequate supplies of metals and minerals.

Finally, I want to state, emphatically, that we do not believe that Government can do this job alone. We do not want to do it alone. We need and we want the willing and eager cooperation of the American business man. We believe that with this cooperation, and only with it, this country can insure itself against the fate of becoming the appeasing and subservient nation that its enemies would like to make of it. We believe that with this cooperation we Americans can preserve our democratic in-

stitutions and that we and our children will continue to live free from fear, free from subservience, free from gangster rule. We in Washington are supremely confident that we shall get that cooperation from this group.

(President Fulforth then said: "It is very evident that we are facing a serious situation for our industry and no one can say that the representative of the OPM has not given us a straight-from-the-shoulder summary of exactly what it is. I am sure that from my contacts with this group in Washington and incidentally I can also assure you that we did not ask for any stainless steel nor nickel nor anything else for the American Electroplaters' Society and its membership, except in a very nice way — it also was a surprise to me that anyone in the country could take that attitude and you may rest assured that we have not done so at any time.")

Dr. Stratton's Answers to Some of the Questions Asked Him

Zinc. "When I was asked to come to this meeting, I said, 'I'll do anything, but please don't send me into a meeting of electroplaters, because it is such dismal news I can take there,' and I really like to go somewhere where I can hand out something pleasant and optimistic, but zinc has suddenly shown some of the same aspects as copper and nickel. When I left Washington there was no fullfledged mandatory priority order on zinc, but I initialled one before I left. I suspect it is probably in the press this morning, or will be tomorrow, unless something happened to it on the way.

"In other words, the situation in zinc in the last few weeks has been such that it has become necessary to place it under general preference order. As I said, and I want to say again, we simply cannot be in a position, although we would like to be, of saying, 'Design out of this metal into that,' because things happen. I think it is probably safe to say, however, that both copper and zinc will be more available than nickel or, obviously, aluminum or magnesium or some of the alloys."

Lead. "At the moment, I can only say that we are not even contemplating a priority order on lead — at the moment; apparently there is no tightness there right now; it is much more available than any other metal. I would hate to make any

guarantees for the future, but for the present, it is not a critically short material."

Tin. "Well, in tin again we have a large supply already in the country, large in relation to any past demands we have ever had for tin. There the situation depends almost entirely on the military situation. As long as we can have ships moving across the Pacific, we will have tin. Again, at the moment, there are adequate supplies of tin, it is not under our control; anybody can buy whatever he can through his commercial sources at the moment."

Chromic Acid. "Chrome ore is in our Division. There are stocks of chrome in this country. Again, it has a good deal to do with the shipping situation. There is a large demand for the metallurgical grade at the moment. We have not placed it under Priority Order. We know some people are having difficulty in getting ferro-chrome in quantities — in the quantity they want and at the time they want it, which is rather more the capacity of making it, I think, than the supply of the ore itself."

Shortage of radium or platinum or any of the higher group metals. "Not as we know as yet. I don't know whether mica is of any interest to electroplaters. There seems to be a situation developing in mica, again because a portion of it is imported from British India and there are shipping difficulties."

Antimony. "As far as I know, there is no difficulty. Cadmium is not under any control, but we are beginning to get the usual build-up, people writing in that they are having difficulty in getting all the cadmium they want and at the time they want it. Whether that is going to grow in proportion, that apparent difficulty in getting it, I don't know, but as for antimony, we have not heard anything — I mean from the point of view of a shortage.

Steel. "We finally moved in on steel in one way or another. We brought out an Order just a few days ago — it is not really a Priority Order — you may be familiar with this, but we have said to anybody who wants to get steel, he goes to his ordinary supply house — this is any kind of steel, carbon alloy, or anything else and this supplier refuses to take his order or his supplier gives him a delivery date which is unreasonable and ridiculous, then

such applicant for steel, if you will, may file with us very simply, his story that he tried to order such and such quantities and sizes and shapes and either could not get the order placed or he could not get a decent delivery. Under those conditions, we go back to the supplier and ask the supplier to show cause why he refused the order, or why he gave this delivery date. Showing cause means that he must prove and demonstrate to us that the orders on his books already are for defense or essential uses and that he is not diverting steel off into non-essential, non-defense uses in order to build breweries or hotels or whatever, which are all very essential to our economy but less essential today, perhaps, than something else.

APPLICATIONS OF METALLIC LITHIUM*

(Republished from *Canadian Metals*, April 1941)

Lithium is the lightest of all solid bodies and has a specific gravity of 0.53. Following its successful commercial production in Germany, some intensive research was undertaken upon its properties as an alloying element. It was found that the addition of a few hundredths percent of lithium gave a degree of hardness to lead and aluminum and their alloys which could not be attained in any other way. A small percentage of lithium added to lead was found to harden the lead sufficiently to form a good bearing metal. A lead alloy of this description, to which the name "Bahnmetall" was given, is used in Germany on railway work and has met with success on account of its hardness and other unique physical properties. A small percentage of calcium is also contained in this particular alloy.

It was also found that lithium easily combines with impurities in other metals, and it has been applied for improving the properties of certain materials. Its capacity for taking up other elements is so great that in a molten condition it is able to abstract carbon, sulphur, phosphorus or occluded gases from alloys and metals. Another interesting feature about this is that melting at 180°C. it forms an amalgam with mercury which in the combination LiHg has a melting point of 609°C.

In the United States it has been found that the addition of small quantities of lithium metal to copper wire bars greatly improves the surface properties of the copper. As a deoxidizing agent in the refining of copper, lithium has the advantage, in contrast to phosphorus, that it does not appreciably reduce the electrical conductivity of the copper

An alloy of extreme lightness, permanence and hardness containing both lithium and beryllium has been produced in Germany. The latter metal protects the lithium from oxidation by moisture or heat, but up until the beginning of the war no information had been given which would indicate the extensive use of this material.

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*From an article by Stephen Coleman in *Metallurgia*, January, 1941.

Coatings *for* Electroplated Ware

Read before Los Angeles Branch Annual Meeting, March 22, 1941, by
M. M. LOESERMAN
Research Engineer
Pabco Research Laboratories, Division of The Paraffine Cos., Inc., Los Angeles, Cal.

IN ORDER to fully appreciate the strides made in the protection of plated metal, let us survey the various aspects of the general question, "What are the problems involved in the formulation of a satisfactory coating?" Consider the surfaces to which coatings are applied. A relatively late volume* on electroplating gives methods and formulae for electrodepositing sixteen metals as well as methods for depositing mixtures of certain metals. Considering only those in larger use, we still have a formidable list: copper, silver, gold, nickel, zinc, cadmium, chromium, tin. Each metal presents its own problem if only from the standpoint of adhesion of the coating. Many different kinds of solutions from which the metals are deposited also introduce variables in the metallic surface which affect the serviceability of the coating.

Like other coatings, finishes applied on electroplated ware must have double utility—beauty and protection. These are linked in all the requirements for satisfactory coatings. We all know that the universal requirement is that of adhesion. A coating must adhere under the conditions of service to which the plated article may be put. It is true that the coating may be marred or even broken by an accidental overly rough use, but it must resist being peeled from the broken area. Abrasion resistance is another important requirement. Very few articles are untouched during their service life, so a coating which is easily worn through is of little value. But because a film which is abrasion resisting may be too hard and be liable to chipping and flaking, toughness is necessary.

These are general requirements for all coatings. Each type of article to be coated then presents its individual requirements. Will it be subjected to oils, greases, and other like substances? The coating must have the necessary resistance. Closely related is the matter of contact with the human body. In this case it must have resistance not only to the body oils but also to the

* "Electroplating," Field and Weill, 1938.

action of the many chemicals present in the "sweat of human toil." I am reminded of a test made by a large utility company in which they hung, around the necks of the men in the boiler rooms, small plated discs with various coatings, as a measure of the perspiration resistance of the coatings. Exterior durability, action under temperature changes, clarity and permanence of color, chemical resistance—these are but a few of the possible other specific detailed requirements.

Intimately connected with any type of application is the preparation of the surface to be coated. Success against spotting out on the metal depends to a great extent on proper treatment before coating. Many reasons have been advanced for this trouble. Included are deposition of hygroscopic compounds in the pores of the metal, retention of organic addition agents in the pores, presence of moisture in the pores, presence on the surface of foreign matter in minute particles, or any combination of these reasons. It can therefore be seen that metal to be coated must be absolutely clean, in fact, approaching "chemical cleanliness." Many systems for cleaning and etching metal for coating are available. Examples are vapor degreasers, solvent degreasers, acid dips, phosphate treatments, and various chemical treatments, such as antimony chloride.

Of equal importance with careful cleaning is the subsequent rinsing which must be both careful and thorough. The method of alternating hot and cold water rinses is, no doubt, familiar to all. Suggestions have been made that after the final rinse, a bake at elevated temperatures be used in order to drive off all moisture, as well as to decompose other deleterious compounds which may not be completely removed by the rinsing. Another suggestion is the use of a vapor dip in a liquid of low surface tension with a view to replacing moisture trapped in the pores of the metal. This must subsequently be driven off. Of more value in this regard is, I believe, the use of a dip in absolute alcohol. This would tend to dissolve out the moisture, as well as any traces of harmful chemicals not removed by the water rinses. Since alcohol in minute amounts will not affect most of the coatings now in use, its presence in the pores should present no difficulty in satisfactorily coating the metal.

Though refinements and improvements are constantly being made by the manufacturers of the various types of equipment,

we have basically the following methods by which to apply the coating to the surface: brushing, dipping, spraying, roller coating, tumbler, and/or centrifugal basket. It is obvious that each method entails the development of formulae adaptable to the method employed, possibly not so much in the basic solid content of the coating as in the solvent portion. Together with the application of the coating must be considered the method of drying the film. Air dried coatings are still extensively used, while force-drying and baking, especially with infra-red, are resorted to where the type of article, type of metal, and conditions of application warrant. This is noticeably true since the development of the newer types of coatings which, when baked, give markedly better adhesion, and resistance to water, chemicals, and oils. Infra-red is finding increased use as a means of shortening the time required to dry the film.

Let us now consider the basic film-forming materials available to the formulator. From these he has to choose those individual types or combinations of types which, when properly compounded with solvents and solvent mixture, with or without pigments, and applied and dried in the specified manner, will give a film satisfying all the general and specific requirements of the problem.

Probably the first materials to be used were spirit solutions such as shellac. They were applied in a thin coat to the warmed metal using fine fitch brushes. Care had to be exercised to prevent undue pile-ups together with avoidance of abnormally thin spots or holidays. Drying was usually forced at 140°-158°F. Defects of such coatings were their tendency to discolor, poor water resistance, tendency to brittleness, and poor adhesion. Oleoresinous coatings, made by cooking and blending oils and resins improved some of these qualities but they had defects of their own. Drying time was increased, necessitating care to prevent settling of foreign matter into the tacky film. Baking of such coatings caused definite color changes which in most cases detracted from the desirability of the coating. Water resistance and adhesion were improved.

It was not until the advent of nitrocellulose after the first world war that coatings for this industry began to assume some promise of attaining the possibility of fulfilling the requirements for satisfactory protection. While in itself not satisfactory in

adhesion and flexibility, it could be compounded with resins and plasticizing agents to give excellent films in these respects. It was natural that development of such resins and agents followed almost immediately. And production of necessary solvents kept pace with the progress. Thus it was possible to make coatings having good adhesion, toughness, abrasion resistance, and color. Fast dry was another advantage inherent in these coatings. However, even the use of nitrocellulose coatings showed the necessity of improvement. Other specific requirements were not always capable of solution—oil resistance, exterior durability, and chemical resistance. Also, the films on aging showed a tendency to lose adhesion (I remember peeling coatings from silverplated salt shakers). Constant control was necessary to check the absence of materials in the ingredients which would cause or increase spotting out on the metal.

The development of other basic raw materials improved the results obtainable with nitrocellulose, and at the same time provided possibility of their use alone. Synthetic resins were the result of research in chemistry. Phenolic type resins form one class. They are made by reacting phenol or a related compound with formaldehyde under varying conditions of temperature and pressure. These materials add water resistance, chemical resistance, and adhesion to nitrocellulose films. When cooked with oils, they form durable coatings in themselves. Such coatings may be air-dried or baked. Other phenolic types, having heat-hardenable characteristics, are capable of forming films which, when baked, are converted into an insoluble form. These have excellent adhesion, abrasion resistance, chemical resistance, and durability. In common with other phenolic types, their use is limited to those applications which do not require colorless films, since they tend to yellow under heat or on aging.

A second class of synthetic resins are the alkyds. Made by the interaction of glycerine and phthalic anhydride, or their derivatives, and, during the reaction, modified by the presence of fatty acids from various oils, resins with a wide variety of characteristics are obtainable. The differences in characteristics are, in large measure, determined by the type of fatty acid used. For example, a soya bean alkyd gives us a good semi-oxidizing or baking film with high color retention. Many of the alkyds are compatible with nitrocellulose and give films which are of

great use, since they have the advantages of the alkyd plus the fast dry of the nitrocellulose. Alkyds are characterized by their good adhesion, durability, gloss and gloss retention. Water and alkali resistance are not high, and for usages which demand these properties they must be fortified with other materials. Some of their characteristics, for example, adhesion and water resistance, are materially improved by baking the film.

The next class of resins is probably the latest basic material to be put at the disposal of the formulator. I refer to the urea and melamine resins. The former are made by the interaction of urea with formaldehyde, while the latter utilize the reaction between melamine and formaldehyde. Both these types of practically water-white resins owe their usefulness in coatings to the property of being converted under heat to hard, chemical and oil resisting films, much the same as the heat-hardenable resins referred to above. Water resistance, color and color retention at elevated temperatures are also excellent. The melamine resins excel the urea types in exterior durability, and in some cases increase the durability of alkyd resins when incorporated even in small amounts. Ureas, on the other hand, give tougher films with somewhat better adhesion than do the melamines. Melamines convert faster, especially at lower baking temperatures, and with proper selection of modifying resins give better color retention at high heats as well as better gloss retention.

While, with a mixture of alkyd resin and nitrocellulose, it is important in coating electroplated ware to use mixtures having low acidity and high initial water resistance, so as to prevent attack of the metal, use of urea type resins allows a wider choice of modifying resin due to the faster cure or set-up of the film. Modifying alkyds are necessary adjuncts for both urea and melamine resins in order to give flexibility and to overcome the natural brittleness of the resins themselves.

The cure of both ureas and melamines is susceptible to retardation by the presence of alkaline salts or high pH, either in the mixture or on the surface. It has been found that their use over electroplated metals containing zinc or cadmium does result in slower cure of the resin than the same mixture applied over a metal such as chromium. Urea is slightly more subject to retardation than is melamine. This is an important point as an example of the difference in results which might be obtained if,

for instance, a urea coating developed for coating nickel plate were used on a cadmium plated article without due regard for the difference in characteristics of the metals. Besides being compatible with alkyds, these resins may also be used with mixtures of alkyds and nitrocellulose, in which the best properties of all three materials are utilized.

There is another class of film-forming materials based on derivatives of cellulose. Cellulose acetate has been familiar for a long time for its fire retardant properties. It is used in making lacquers where this property is important. Its range of usefulness as compared with nitrocellulose is somewhat limited because of its lesser compatibility with many modifying agents, and its more limited solubility in many liquids. Its heat and light stability are much better than nitrocellulose, and its films display greater flexibility and toughness. Cellulose acetobutyrate is also fire retardant and is subject to the same limitations as the acetate. Like the acetate, its heat and light resistance are excellent, and of interest is the fact that properly formulated films of this material show good exterior durability. The gloss of its films is not so high as that of nitrocellulose films, having a softer, subdued sheen. Ethyl cellulose is characterized by its high tensile strength which, with its flexibility, imparts toughness to the film, a property which it retains at elevated temperatures. Like the two preceding materials, it is fire retardant and shows good light and heat stability. Its compatibility with various modifying agents is considerably greater than that of either the acetate or the acetobutyrate, as is also its range of solvents.

Various types of "synthetic rubber" form still another class of basic materials. Most of these are characterized by their excellent resistance to chemicals, and find their greatest use where such resistance is necessary. It is important to determine whether they are subject to decomposition on aging, however, since any decomposition leading to formation of products such as hydrochloric acid or a sulfur compound would be injurious to the metal. Modified with plasticizing agents having comparable chemical resistance, they would find use in protection of surfaces which it is desired should not be plated in contact with the plating solutions.

Other basic materials having possible use for specialized purposes might be classed as polymerized resins. Examples are

vinylite copolymers, polysterenes, and methacrylates. These are more or less water-white resins, with various solubilities and compatibilities, having various degrees of thermoplasticity, adhesion and resistance to water, chemicals, and exposure. They are capable of being baked to improve the desirable characteristics of the films.

A great deal of thought must be given to any problem involving formulation. And with so many variables a part of the problem there is always the need for close cooperation between the technical men of the plating industry and those of the coating manufacturers. All those details which enter into the correct deposition of metals, solutions used, cleaning methods, condition of the deposited metal, buffing methods, etc., should be freely discussed. Detailed information as to handling methods, including drying and packing schedules, should be freely given. And, of great importance, the various properties desired in the coating to give the service expected should be completely detailed. Only in this way will the members of the industry be able to take advantage of the services of the research laboratories which the coatings industry has built up to better serve electroplaters in the development of coatings for electroplated ware.

GEORGE B. SVENSON BACK WITH H-VW-M COMPANY

George B. Svenson, head of the Platers Supply Co., Cleveland, Ohio has rejoined his old organization, the Hanson-Van Winkle-Munning Co., of Matawan, N. J., manufacturers of electroplating equipment and supplies. Mr. Svenson will represent the H-VW-M Co. in Ohio with his headquarters in Cleveland. The Platers Supply Co. continues under the direction of his son, George B. Svenson, Jr.

PLATING AND RUSTPROOFING ASSOCIATION ELECTS

The Plating and Rustproofing Association of Michigan held its annual meeting in March. Mr. J. C. Nankervis, of the Advance Plating Company, was elected to the Board of Directors. H. E. Adelsperger, Charles Erdman, Paul H. Henning, W. B. Knight, J. C. Nankervis, Robert L. Reed, and Percy L. Stapleton were reelected.

At a meeting of the Board of Directors, subsequent thereto, Mr. Robert L. Reed, President of the Robert L. Reed Company, succeeded to the office of the President for the year 1941-42 in place of Mr. W. B. Knight, and Mr. Charles Erdman, president of the Central Plating Company, was elevated to the office of vice-president, while Frederick R. Bolton was reelected for the fourth year as secretary-treasurer.

The Association has been consolidating its position and it is the feeling of the membership that with the defense program and the possibility of a war program to follow, the association will become more than ever a necessity to the industry and that the members will be amply repaid for their effort spent in pioneering the movement. —FREDERICK R. BOLTON

Plaque presented to Mr. John Oberender by New Haven Branch for faithful Service.

Congratulations to Mr. and Mrs. Horace H. Smith on their thirty-first wedding anniversary.

Many thanks to Los Angeles Branch for the gift of oranges to the Convention at Boston. They were much appreciated.

COMMITTEE TO COLLECT ANTIQUES

President Candee has appointed Mr. George B. Hogaboom Chairman of a committee to collect antiques of all kinds relating to the electroplating industry. The articles when collected will be placed in a suitable building or museum, so that future generations may have the privilege of contrasting things of yesterday with the rapidly changing conditions that will develop in the years ahead.

Our members are asked to cooperate heartily with Mr. Hogaboom in connection with such a display. The above action is sponsored by vote of the Boston Convention delegates.

Copper *and* Tin

Read before Milwaukee Branch Annual Meeting, April 26, 1941, by
VINCENT MATTACOTTI
Hanson-VanWinkle-Munning Co.

THE electroplating field at present is facing a period in which the need for sensible precautions will be required to prevent undue discomfort. While unquestionably shortages of essential metals are occurring, it is well to keep in mind that we have many ways of continuing to produce electroplating, giving the same standard of service as in the past. For the most part, we have at hand methods now being termed "substitutes" capable of seeing us through this period. In some cases we may have to deal with increased cost of production, in others with increased cost of electroplating processes; but because of our great variety of metals we shall not be forced to face a discontinuance of a great share of our field.

The subject of copper appears to be one which will be favored with increasing attention because it is being used to fill out our shortages in other metals. By increasing the use of copper we are in many cases able to decrease the need for heavy thicknesses of metals not readily obtainable.

Copper occurs in the native, or metallic, state and many of its ores are easily reduced, thus accounting for its use since very early times. Native copper occurs in masses in Sweden, the Ural mountains and in large quantities in the vicinity of Lake Superior. Copper oxides, sulfides and mixtures of copper, iron and sulfur are found widespread in the United States, South America, Africa and parts of Europe. Available to us are large domestic tonnages, now being supplemented by South American metal. In normal times, when the price is right and transportation facilities are available, imports can be had also from African smelters.

According to a recent press statement by Mr. Kelley of Anaconda, "copper shortages are indicated." He forecasts that the situation may become a major defense problem. Considering the widespread use of this metal in ammunition, military motor vehicles, automobiles, and special alloys such as brass for general industrial purposes, it is readily apparent that increased ton-

nage requirements are to be expected as the defense program forges ahead.

At present the domestic output is 85,000 tons per month, including secondary or re-manufactured copper. From Chile we will obtain another 50,000 tons per month, all of which is primary metal. Copper stocks are being depleted at such a rate that all this and more will be required to keep industry moving. Insofar as Canadian copper is concerned, it appears as though Great Britain will have need of it all. As previously stated, the South American fields are now shut off from the United States.

Deliveries of copper for the first part of this year constitute a record: February....112,819 tons; March....134,330 tons. These deliveries caused further reduction in refined stocks, so that at present only 89,870 tons are on hand. This is a steady decline in stocks on hand since July, when the figure was 215,823 tons.

In February domestic consumers were seeking copper in an amount exceeding total on hand by 167,000 tons. Because of this, it is necessary that we look to South America for supplemental requirements. A diversion of the entire South American production to the United States would go far toward alleviating the situation.

The government has been acquiring stocks for reserve from both domestic and foreign sources. At present no definite figures are available as to the amount. A total of 200,000 tons has been ordered from South America, to be delivered at about 25,000 tons per month beginning in March. This would go far in taking care of the reduction in copper stocks of 20,000 tons per month estimated for the first half of 1941. Always, of course, assuming no drastic change in consumption occurs.

Consumption figures, while signifying little at the moment, nevertheless do indicate a trend:

1936.....	966,000 tons
1939.....	804,238 tons
1940.....	1,110,400 tons

(Consumption now running at the rate of 1,500,000 tons)

In the electroplating field copper is widely used for purposes such as electroforming, electrotyping, as an intermediate coating on steel and die castings, for flash plates to assist in cleaning or

to promote better adhesion of nickel to base metals. The situation at present is such that more copper is being used than formerly. Where heavy deposits of nickel ranging up to .0015" were customary, we now find many instances of the use of copper deposits up to a thickness of .001" followed by a light nickel deposit. Such deposits are treated according to the method involved in their production. The dull copper is buffed to proper color and then bright nickel plated; this makes possible the use of nickel coatings as thin as .0002", which are subsequently chromium plated. Several bright copper solutions are available which produce, on proper surfaces, a deposit sufficiently bright to go to bright nickel directly.

Copper is deposited generally from any of three different baths; namely, the cyanide, the acid and a newcomer, the amine bath. Of the cyanide type, three variations exist familiar to all. These are the regular cyanide, the Rochelle cyanide and the duPont "High Speed Copper" bath. In view of the present situation on Rochelle salts, the use of the Rochelle bath may be curtailed considerably and in all probability this bath will find its maximum usefulness when coupled with either the acid bath or the amine bath. The situation in cyanides has become such that expansion in the use of cyanide baths may not be possible. At the moment, efforts are directed toward providing cyanides in accordance with previous use on the part of the individual concern. We believe it will be difficult to obtain sufficient cyanides during the balance of 1941 to do more than take care of present solutions. Because of these two situations, we find the acid copper bath returning to prominence after many years of comparatively little use. Steel is being flashed in cyanide copper and then heavily plated in acid copper. Since this solution consists essentially of two readily available materials, copper sulfate and sulfuric acid, the situation is quite favorable as far as increased use of this bath is concerned. By buffing heavy thicknesses of acid copper we can obtain a surface on which thin coatings of bright nickel can be deposited, thereby assisting in overcoming some of the difficulties attendant upon a decrease in nickel available.

The Weisberg amine copper bath is gaining prominence owing to two features, the fact that bright copper deposits are readily obtained and the fact that no shortages of material used in the

bath are foreseen. Essentially, the solution is composed of copper sulfate, amine, a wetting agent and ammonium compounds. The solution operates at temperatures ranging around 140°-150°F., with suitable agitation of the work. Steel and die casts are flashed in cyanide copper and then transferred to the amine bath, where the proper thickness of deposit is applied. When the base is properly prepared the luster and appearance of the copper warrant the application of bright nickel directly, with no intermediate buffing. In one plant the procedure being followed involves cyanide copper flashing of the buffed die cast for two minutes, then a 15-minute amine copper plate to give .0005″-.0007″ thickness, then a bright nickel of .0002″ thickness, followed by the usual chromium plating.

Summarizing the copper situation, we note the increasing use of copper in electroplating primarily as a substitute for heavy nickel deposits. At present there is sufficient copper available to meet current demands. For the future we shall have to depend on increased domestic production, as well as increased foreign purchases for adequate supplies.

On the question of tin, our situation is comfortable and so far as electroplating is concerned can well continue to be so. Consumption of tin by the electroplating field is nominal compared to other uses. Tin has a wide variety of uses, ranging from protective coating of tin cans to the weighting of silk. It occurs in Siberia, Bolivia, Cornwall, the Dutch East Indies, and in Africa. World production in 1940 amounted to 236,000 tons, as compared to 184,000 tons in 1939. In 1940 the United States received 115,500 tons, which included emergency reserve stocks. This compared with import in 1938 of 50,000 tons and 1939 of 72,000 tons. It is estimated that at the current rate of demand, present tin stocks will last 15 months. At the moment tin is given priority in shipping space and in this way a steady flow is assured. The first two months of this year showed an increase in imports of 9,000 tons over the same period last year.

For the first time since World War days, smelting and refining facilities are being established in the United States proper to handle tin concentrates. Bolivian ore now stored in warehouses will shortly be transformed into tin metal and provide an estimated 18,000 tons of tin per year. Bolivian ore, together with the supply the United States has on hand and on the high seas,

is estimated to be sufficient for American industrial requirements for the next two years. Specific figures recently published place the reserve stock on hand at 100,000 tons, with 1941 consumption estimated at 70,000-75,000 tons.

The can industry uses currently over 50% of the tin consumed and estimates that by reducing weight of coatings, a 15% reduction of tin consumption will be brought about. Thus 7,500 tons of tin will be saved by this one industry, or to put it in another way,—one-tenth of the annual consumption will be saved.

For the long term picture we must keep in mind the lack of stability of the Far Eastern situation and the decline in ship tonnage available for transporting supplies.

In our field, tin is used extensively to coat automobile and tractor pistons for "breaking in" purposes, to line food containers such as cooking kettles, for radio parts, electrical refrigerator parts, electrical apparatus, wire and sheets, and other purposes. Tin is generally deposited from the Stannate bath familiar to all. Among new developments are the use of tin in the Corronizing process, which involves the deposition of small thicknesses of two metals such as nickel and tin, or nickel and zinc; subsequent heat treatment produces an alloy layer which possesses marked protective qualities. There is a process developed by several Milwaukee members involving the deposition of thin coatings of tin and subsequent treatment to produce a non-porous, highly corrosion-proof surface.

For the moment no serious shortage faces us so far as tin is concerned. With the further development of the two above mentioned processes, we may find it possible to look upon tin as a possible substitute for such metals as may be difficult to obtain.

All figures are from the *Chicago Journal of Commerce.*

PENNSYLVANIA SALT COMPANY ELECTS

George B. Beitzel, Manager of Sales of the Pennsylvania Salt Manufacturing Company has been elected president of the Sales Managers Association of Philadelphia and will assume his duties at the Fall meeting of the Association. Mr. Beitzel is well known in the metal cleaning industry and his selection for this honor will be heartily approved by all of his friends.

MORE STORAGE SPACE FOR HANSON-VAN WINKLE-MUNNING

The Hanson-Van Winkle-Munning Co., Matawan, N. J. manufacturers of electroplating equipment and supplies has rented the plant of the Fisher Bag Company in Matawan, for use as a storage warehouse.

NEW YORK BRANCH HONORS ONE OF HER FAVORITE SONS

(Reprinted from *Metal Finishing*, June, 1941)

The New York Branch of the American Electroplaters' Society in cooperation with many friends and associates of Ben Popper honored him with a banquet and testimonial speeches at the Hotel Pennsylvania, New York City on Saturday evening, May 17. A scroll, printed in gold, was given Mr. Popper to signify the occasion and was signed by the 126 people in attendance.

"Ben," as he is affectionately known by his many friends, started his career with the Egyptian Lacquer Mfg. Co. on July 5th, 1901, as an office boy with duties ranging from taking care of fires in the morning to sweeping up at night. In 1904, his ambitions to become a salesman were realized and he was given a territory in New York City where he has worked continuously ever since. Ben was one of the first lacquer salesmen to be elected to the A.E.S. and his

BEN POPPER

membership dates back over 25 years. He has served the Society long and well and Ben is one of the first to arrive at annual meetings, greeting the newcomers with a smile and offering helpful advice.

The testimonial dinner was arranged largely through the efforts of Frank J. MacStoker, Ralph Liguori and Henry Levine. Frank MacStoker acted as toastmaster and did an excellent job. Testimonial speeches were made by Ralph Liguori, John Rolff, Horace Smith, W. J. R. Kennedy, Dr. Walter R. Meyer, Henry Levine, T. Hofacker, Vice Pres. of Egyptian Lacquer Mfg. Co., and O. J. S. de Brun, Vice Pres., Egyptian Lacquer Mfg. Co.

In his speech in response to the testimonials Ben said:

"The average man or woman is indeed fortunate who goes through life with two or three sincere friends but as I look around this room and see the faces of so many of you whom I count among my most loyal friends, I feel indeed as though I have been blessed with a larger share of friendships than any man could hope for.

"I do not know what I have done to deserve this splendid tribute. . . . Whatever small contribution of effort I have made to the Society, I have made because I really wanted to. . . . I have worked for the organization because I realized that whatever I could do to help would always be appreciated by you.

"During my thirty years of association with the New York Branch of the American Electroplaters' Society, I have been fortunate in making and keeping so many friendships among my fellow members. . . .

"It is difficult for me to tell you in mere words of my heartfelt appreciation for this wonderful demonstration in my behalf.

"To each of you and most particularly to the committee responsible for the arrangement of this grand affair, I extend my sincere and earnest gratitude.

"Thank you."

Congratulations to the American Electroplaters' Society for a most successful Convention.

A. B. C. CHEMICAL CO.
P. O. Box 16, Waterbury, Conn.

New England Representative for

MECHANICAL PROCESS CO.
Degreasing Machines

SOLVENTS RECOVERY SERVICE, INC.
Reclaiming of Dirty Thinners

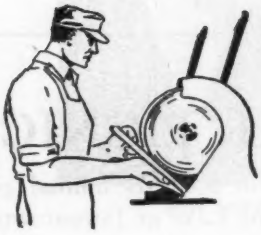
ANNUAL PICNIC

The Buffalo Branch will hold its annual picnic at Celeron Park on Chatauqua Lake at Jamestown, N. Y., July 19. This event will proceed regardless of the weather and members are cordially invited to bring their lady friends.

The feature attraction of the day will be the serving of a chicken dinner. Games and contests, open to both men and women, will follow with handsome prizes awarded to the winners.

Tickets costing $1.50 single or $2.50 per couple may be obtained from Mr. J. Ruff, 1368 Michigan Ave., Buffalo, N. Y.

LEA *Finishin*



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Specialists in the Production of C ***Buff***

nEngineers . . . specialists in the technique of finishing articles made of various materials, a service particularly valuable today on a number of key defense projects.

Finishing of surfaces and preparation of these surfaces for finishing is today a science involving a technique by itself. The scores of compounds carrying the name "Lea" are but a means to an end. Our research and field men—all graduate engineers—have had years of experience in studying finishes and finishing operations. They are qualified to suggest how the rough part should be made to attain the desired results . . . then what steps to take in both pre-finishing and finishing operations.

Fortunately, much of the work done previously in times of peace is now finding an outlet on several vitally important defense projects . . . projects where the exactness of the finish and precision in carrying out the various steps are imperative. We were able to draw upon our experience in such a way as to solve the problems quickly and economically.

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Business and Social News

BRANCH NEWS

Educational Activities

AMERICAN ELECTROPLATERS' SOCIETY

Springfield Branch held its April meeting at the Hotel Charles on the 28th at 8:00 P.M. The meeting was called to order by President Costigan. A letter from President Fred Fulforth was read in which he explained the metal situation and the method the OPM is using in supplying the platers with essential metals. Letters from the Buffalo, Grand Rapids, Milwaukee, and Cleveland branches were read in which they made their bids for the Convention city in 1942. It was decided that delegates use their own judgement in casting their ballots at the Boston Convention.

For the 1941-1942 officers, the following were elected: president, A. W. Wood; vice-president, I. D. Niles; secretary-treasurer, D. S. Hartshorn, Jr.; librarian, F. J. Clark; board of directors, William Seidel, A. Logozzo and N. Plank.

The following delegates to the National Convention were appointed: A. Copp, W. Seidel, and Colin Hastie; alternates, A. Logozzo, A. Stevens, and N. Plank.

Mr. Costigan then introduced Mr. Louis W. Reinken, chief engineer of the Green Electric Company, New York, who presented an interesting talk on the selenium rectifier. Mr. Reinken compared the rectifier with the motor generator and other types of rectifiers, illustrating his talk with photographs and a selenium stack, the heart of the selectroplater.

His talk aroused considerable comment and he was kept busy for half an hour answering questions

D. S. HARTSHORN, JR., *Secy.*

Providence-Attleboro Branch held its May meeting on the 19th at the Biltmore Hotel. This meeting was devoted to business and the election of officers. The officers elected for the coming year were Robert D. Maclachlan, president; John T. Henry, vice-president; Fred E. Allen, secretary-treasurer; Pierre B. Lonsbury, librarian; Clarles Law, James Potter, Arthur Wood, board of managers.

Delegates for the convention are Donald Wood, George Desmoreau, Charles Chace; alternates are Pierre Lonsbury, Byron Abedon, James Potter. A favorable vote was cast on amendments suggested by Los Angeles and Milwaukee branches and delegates were instructed to that effect.

The branch was pleased to have present Past Supreme President Feeley of Montreal branch who spoke for a few minutes.

R. D. MACLACHLAN, *Secy.*

Grand Rapids Branch held their meeting May 8.

The delegates were elected as follows for this year's National Convention: M. R. Caldwell, Anthony Preston, and Ivan C. Hepfer; alternate delegates: Chester W. Smith, Stewart Z. Martin, and Laurence Cornelius, Jr.

It was unanimously voted upon and decided that a summer outing should take place in August and a committee was appointed consisting of F. T. Pace and Charles O. Werft, who are to decide upon where the picnic is to be held and notices sent to all members and their friends at a later date.

The meeting was then turned over

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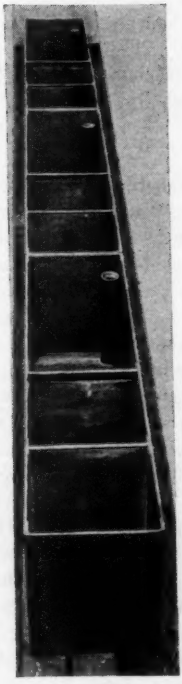
Stortslinings stand up to their jobs because the materials in them are expertly selected, and because extra multiple-pass welding is used at every joint to make doubly sure that no joint failure can possibly develop.



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Stortslinings are fashioned to protect your profits by stopping corrosion losses, and by outlasting your expectations of service and durability.

We also furnish solid lead tanks, coils, anodes and all varieties of fittings and assemblies of lead.

STORTS WELDING COMPANY

42 Stone Street **Meriden, Conn.**

Manufacturers of Welded Fabrications to Specification

to our speaker for the evening, Dr. M. M. Beckwith who talked on "Some Mistaken Ideas Relative to Alkaline Cleaning." His talk was illustrated and proved very interesting and instructive.

Mr. Robert V. Twyning, one of our own members gave a very interesting paper on Polishing Compounds, describing their characteristics and applications.

No further meetings will be held until September.

C. E. ABEL, *Secy.*

Philadelphia Branch held its regular monthly meeting at the Harrison Laboratory, University of Pennsylvania, President Keller presiding.

Due to the resignation of Secretary Himes, J. E. Underwood was appointed acting secretary.

The speaker for the evening was Dr. Klinkenstein of the Maas & Waldstein Company and his subject was "Infra Red Baking." His talk was most interesting and after answering many questions the Doctor was given a rising vote of thanks for his fine efforts.

The applications of Mr. Robert Ledig and Joseph Hackenburg were received and referred to the Board of Managers.

The death of one of the oldest members of Philadelphia Branch, Mr. John Mahaffy who died on May 18th was reported and a letter of condolence was ordered sent to his children.

A motion was made that the June meeting be a dinner meeting and a testimonial to Joe Underwood for his years of service to Philadelphia Branch and the A.E.S.

Supreme President Fulforth installed the officers for the coming year and asked the members to support them as in the past. The new officers are president, Harry Keller; vice-president, Nat Verelle; Secretary, Paul Mentzer; treasurer, Geo. Long; librarian, Jean Zurback; board of managers, J. E. Underwood, Geo. Gehling, and Al. Hirsch. Delegates are F. Fulforth. A. Hirsch, and J. Zurback.

JOSEPH E. UNDERWOOD, *Acting Secy.*

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Copper Anodes

... because their unexcelled purity assures uniform corrosion, the highest quality deposit in the shortest possible time and low scrap losses. Furnished with suspension holes drilled as desired, or tapped for end hooks.

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Binghamton - Syracuse Branch held its regular meeting at the Hotel Cortland, Cortland, N. Y. Friday May 23. This was the annual meeting at which the regular election of officers was to be held. Before the election of officers was held the meeting was opened for a general discussion at which time our librarian, Mr. William Mahar, gave a very interesting talk on nickel plating with insoluble anodes and also had several samples which he had plated.

The nominating committee presented

the following names: president, William Mahar; vice-president, Herbert Langenmeyer; secretary-treasurer, F. W. Kenyon; librarian, Harry Herlikofer; Board of Managers, Austin Fletcher, Jack Harnett, and George Fahrens. These names were voted upon and carried.

Our newly elected president gave a very touching and inspiring acceptance speech and outlined some plans for the coming meetings.

The next meeting will be held at Hotel Cortland, Cortland, N. Y., June 27. Committees were also appointed for an outdoor meeting to be held in July or August.

F. W. KENYON, *Secy.*

Newark Branch held its regular meeting Friday evening May 16 in the Club Room of the Hotel Douglas. The meeting was called to order at 8:30 P.M. with President William T. Maguire presiding.

Mr. Horace Smith and Mr. Louis Donroe made final reports on the Educational Session and Banquet. Our Branch and the Ladies Auxiliary will hold their regular meetings at the Hotel Robert Treat beginning July 18, 1941.

Mr. George Wagner made the financial report for the fiscal year May 1-1940 to May 1-1941, and Mr. Paul Oldam reported that the Board of Managers had audited the Secretary's books and found them correct with the financial report.

Mr. Oldam stated that he had made definite arrangements for the members and their wives to meet at the General Motors plant in Linden, N. J. on June 3 at 8 P.M. to go through the plant.

Mr. George Klink suggested that all the married members induce their wives to join the Ladies Auxiliary.

Mr. John Feeley of Montreal, Canada was a guest at this meeting and our President called upon him for a few remarks. Mr. Feeley told us all about how things were going in Canada.

All the present officers are retained in office for another year: William T. Maguire, president; William Bruhns, vice-president; George Wagner, secretary-treasurer; Louis Donroe, librarian; Roy Stout, sergeant-at-arms; Horace Smith, John Kotches, and Paul Oldam, Board of Managers.

Mr. Paul Oldam was next presented as the guest speaker of the evening by our Librarian Louis Donroe. Mr. Oldam first entertained the members for a half hour with tricks of magic then gradually drifted into his subject "Gold Plating on Novelty Jewelry." He stated that there was just as much magic in producing the gold finishes

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he exhibited on a sample board as there were in the magic tricks that he showed us. Beside the sample board which was on exhibit at the Boston Convention, he showed us many articles of jewelry some of which went through the stripping process which is an old process now called electrolytic polishing. Paul promised to send a complete resume of his talk to the MONTHLY REVIEW for publication.

GEORGE WAGNER, *Secy.*

Detroit Branch meeting, held May 2. Dr. Blum of the Bureau of Standards gave a comprehensive talk on the "Effects of Metal Shortages on Plating Practice." He listed magnesium, aluminum, nickel, zinc, cadmium, chromium and tin as metals of which we have an inadequate supply. Steel, copper, lead and silver, while not too easy to get at the present time, are more plentiful and increased production facilities should in time make them more available.

The goal of the OPM and its priority division is as follows:

(a) Meet direct defense needs, including not only armament, but also camp equipment, etc. (cooking utensils, tableware, garbage cans, surgical instruments, barracks, defense housing, emergency factory expansion). These needs may involve new or increased demands for certain plated coatings.

(b) Meet needs of England.

(c) Meet other essential needs of Government, B.E.P., Post Office, etc.

(d) Meet needs of public.

Dr. Blum explained the problems of Government in handling the enormous defense program and discussed many ways in which the plating industry might be able to help. He mentioned many possible substitutions that could be used in place of present materials. In conclusion he stated (a) Defense needs can be met with few changes in regular specifications. (b) In specific cases, use of plated metals will save much larger amounts of strategic metals. (c) The plating industry can and will carry on, but not necessarily in the same way.

An enthusiastic discussion followed Dr. Blum's talk.

Dr. M. M. Beckwith of the J. B. Ford Sales Company, Wyandotte, Mich., presented a brief discussion on the "Effects of Chromium Contamination in Cyanide Copper Plating Solutions." In addition to reducing the efficiency of the copper plating solution, chromium contamination produces streaking and blistering of the subsequent nickel deposit.

In cases where a copper strike is used

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LATHES
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Besplate
NICKEL ANODES
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McGEAN CHEMICALS

for Better Nickel Deposits and Greatest Satisfaction

USED BY THE LEADERS IN THE INDUSTRY

THE McGEAN CHEMICAL COMPANY
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prior to an additional copper plating solution, chromium contamination in the copper strike bath will produce blistering of the secondary copper plate.

The effects of this chromium can be reduced and under conditions where Rochelle salt is absent in the copper plating solution, chromium will be completely removed by the addition of a small quantity of Sodium Hydrosulfite. In order not to confuse this material with other chemicals of a similar nomenclature, formula for Sodium Hydrosulfite was given ($Na_2S_2O_4$).

Dr. Beckwith's talk provoked a lively discussion which was highly instructive to the members.

A moving picture from the Bureau of Mines entitled "Manufacture of Abrasives" was shown and enjoyed by all.

Installation of officers elected last month was conducted ably by Mr. B. F. Lewis. The new officers are Walter L. Pinner, president; James E. Fritts, vice-president; Warren I. Grimmer, secretary; Edgar A. Hahn, librarian; while the Board of Managers includes W. W. McCord, Charles Beaubien and H. M. Cherry.

WARREN I. GRIMMER, *Secy.*

Chicago Branch held its regular monthly meeting May 10 at the Atlantic Hotel, President M. H. Longfield presiding.

Mr. H. Smallman read the report of the committee on the questionnaire sent out by Chicago branch and same was ordered sent to our National President Mr. Fulforth, after which the committee was discharged with a vote of thanks.

Mr. M. H. Longfield asked Mr. O. E. Servis to install the new officers and Oscar did a very fine job of it, explaining the duties of each office to the new officers, adding a lot of wit and humor and causing a lot of hearty laughter. Mr. O. Weickmann introduced Mr. R. S. Modjeska who spoke on "New Sources of Metal." He made a very fine and interesting talk and told of the many strange formations of rock and metals. J. W. HANLON, *Secy.*

Buffalo Branch held its regular meeting at the Bailey Bowling Academy May 9. The following members were elected as officers for the coming year: president, J. Ruff; vice-president, R. Fischer; secretary, R. McGhee; treasurer, F. Nowakowski; librarian, C. J. Wernlund; sergeant-at-arms, F. Wirges.

Delegates for the convention were also chosen and the business of the evening was concluded by a financial

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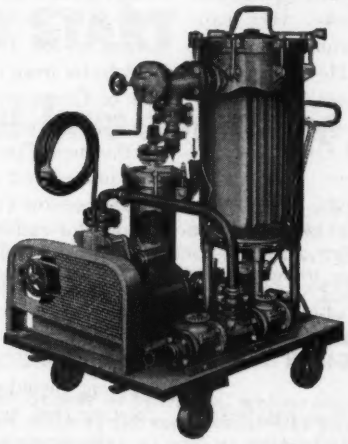
- *And Others*



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LARGE FILTER CHAMBER — Affords greater sludge holding capacity, making ideal system for removal of carbon or lime from treated solutions in process of eliminating iron, organic matter, oil, etc.

LOW OPERATING COST — Sturdy construction and simplicity of operation makes cost of filtration negligible.

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statement by treasurer Frank Nowakowski.

The guest-speaker Mr. Rinker of Oakite Products was introduced by President Joe Ruff. His subject was "The Cleaning of Metals before Plating." He gave a very comprehensive talk on this all-important matter as it confronted the average plater. He discussed at length the comparative merits of anodic and cathodic cleaning. The various points of his address were emphasized by the use of lantern slides. The usual discussion followed during which Mr. Rinker very capably answered several problems brought up by the members. He was given a rising vote of thanks and a hearty invitation to pay us a return visit.

RODERICK MCGHEE, *Secy.*

Los Angeles Branch. After our usual dinner President Don Bedwell opened the May meeting for the transaction of regular business. President Bedwell requested Mr. Earl Coffin to officiate at the installation of the Branch officers for the 1941 to 1942 year.

Mr. C. C. McLaren was installed as sergeant-at-arms; E. Frauenhoff, as secretary-treasurer. Mr. Frank Rushton was installed as vice-president and he was reminded that he was also to act as Chairman of the Membership Committee.

Mr. Bedwell was installed as president and informed of the appreciation of the branch for his fine work during the past year.

Mr. E. Holman who was to have been installed for his fourth term as Librarian was absent because of illness. A token of the branch's esteem (a briefcase) was given to Mr. Bedwell to be presented to Mr. Holman at a later date.

A letter from the Los Angeles Chamber of Commerce suggesting that Los Angeles be proposed as the location of the next Convention was read. It was moved and carried that this letter be turned over to the officers of the branch for consideration.

Lynn Reynolds and Arlie Morgan, both of the Adel Precision Products Corp. were initiated.

It was moved, after considerable discussion that a letter be sent to the supreme president of the society requesting that he exert his influence to

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Yet the finish, a film of lacquer or synthetic, measurable only in thousandths of an inch, can be and often is the most important part of the product. In many cases it must be decorative as well as protective . . . It must be easy to apply and must give a maximum of efficiency at a minimum of cost. You will find these and many other advantages in Egyptian Industrial Finishes, each one of which is so formulated that it can be relied upon to measure up to the task for which it is selected.

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the utmost to secure a more just and equitable distribution of the available supplies used by electroplaters.

Mr. Ralph Pettit, of the American Aluminum Corporation spoke on "Aluminum and Its Finishes." He also had a display of the various finishes of aluminum. We were then shown a film "Aluminum, From Mine to Finished Product." The members found this portion of the evening extremely interesting and educational.

ERVIN FRAUENHOFF, *Secy.*

Anderson Branch held its regular monthly dinner meeting May 13 at the Y.M.C.A. with our new president, Mr. Rex Oyler presiding.

Dr. M. M. Beckwith of the J. B. Ford Sales Company was speaker for the evening. His subject was, "Some Mistaken Ideas about Cleaning." Dr. Beckwith discussed the various phenomena involved in cleaning prior to plating in relation to the materials that must be removed from the base metals. He interestingly illustrated the factors he discussed by placing them in checkerboard fashion on a blackboard to impress upon our minds the complex nature of cleaning.

E. L. MCKINNEY, *Secy.*

Baltimore-Washington Branch held its final meeting of the season at the National Bureau of Standards on May 10th. Our vice-president, Mr. Curtis Beetham, officiating in president Hahn's absence, did so well that he was selected to take over the job as our new president. Sam Warnock added another to his many titles and activities by accepting the job of vice-president. Mr. Thomas as secretary and treasurer, and Dr. Brenner as librarian were held on for another term. Mr. K. M. Huston was appointed to cooperate with Mr. Warnock in his ex-

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officio job of scaring up new members.

After discussing convention affairs, Messrs. Slattery, A. Pierdon, and Huston were elected delegates, with Messrs. Ermlich, Warnock, and Turner as alternates.

For the educational session, Dr. Blum addressed a well attended open meeting on the timely subject "Effects of Metal Shortages on the Plating Industry," with facts and figures as to the present situation and a plea to maintain high standards of plating.

C. T. THOMAS, *Secy.*

Montreal Branch. The regular monthly meeting was held on Monday, May 5, at the Mount Royal Hotel.

A surprisingly large number of members were present considering the unseasonable fine weather.

The installation of officers was held and Honorary President J. H. Feeley was elected to install the incoming officers, with the able assistance of Jack Reisenberg (Lea Products trouble shooter).

Members now holding office are H. S. Jordon, president; F. R. Lunn, vice-president; E. Feeley, secretary-treasurer; E. H. Marsh, librarian.

Our librarian started his new duties by reading an interesting paper on "Hard Plating" covering all angles of this subject. The article was then open for discussion and our librarian was kept busy answering questions to a rather late hour.

Eugene Feeley, *Secy.*

Rochester Branch. After our regular business meeting and election of officers we were fortunate to have as guests Dr. Beckwith and Mr. Wesley of the J. B. Ford Company. Dr. Beckwith graciously consented to speak a few words on pH control of cyanide solutions and chrome contamination in copper strike. Well he certainly spoke and for a man without a prepared talk he certainly gave out a lot of information which was most interesting and instructive. Come again Dr. Beckwith and as often as possible.

JUDSON R. ELSTER, *Secy.*

Toronto Branch held its regular meeting at the King Edward Hotel. President Jim Graham opened the meeting with a good attendance and stated this meeting would be the last one until September 5.

After reading the minutes of the previous meeting, Allan Byers read

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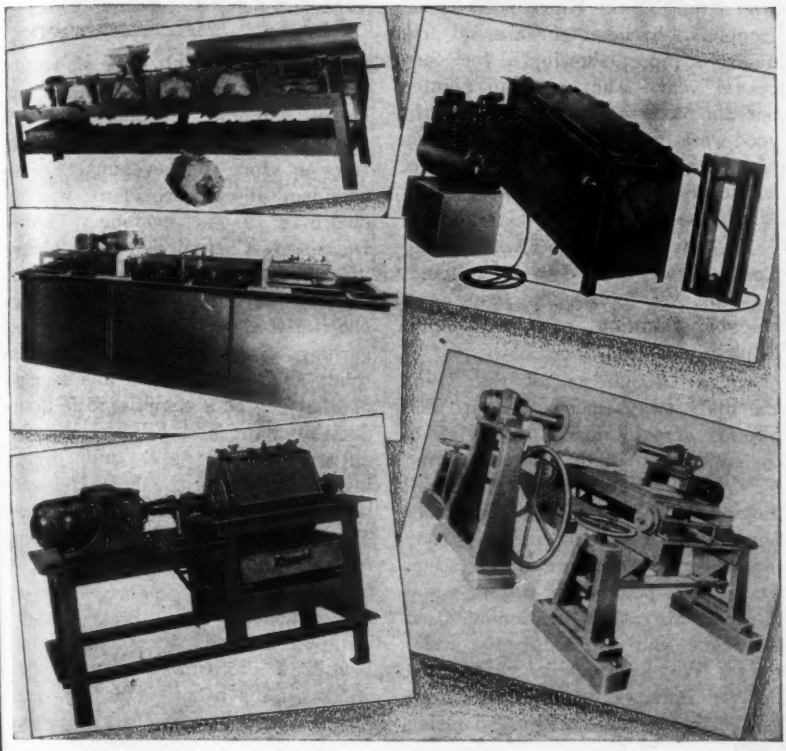

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Top Illustration: Salt Spray Corrosion Testing Equipment. Bottom: Flat Stock Buffing Machine.

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the attendance report for the past year and surprised some of the members who acted like the King Fish with ear trouble. Charlie Kemish read the auditor's report showing a very successful year. The chairman pointed out the necessity of keeping up the good work by bringing in new members (Art Severs was listening). Regret was expressed at the illness of Jack MacLean.

Mr. Roy Bast of the Canada Skate Company was elected to active membership. We look upon Roy as a valuable addition to the Toronto Branch.

Mr. J. Richardson of the Trans Canada Airways then spoke on "The Skyway across Canada, from Halifax to Vancouver" with colored moving pictures and sound effects. Although moving pictures of this type are rather unusual in a plating meeting they proved very instructive and interesting. The speaker pointed out the ways and means of air travel, mentioning speed and time and explaining the radio beam. We were all in that plane (Walter Barrows, too) looking down on the tips of the Rockies and seeing formations we never knew existed. Thanks to you, Mr. Richardson! Come again. JAMES S. CAIRNS

Hartford Branch held its regular May meeting at the Elks Club, Bristol, Conn., Monday evening May 19. Moving pictures were the main attraction for the evening. Former president Joseph St. Pierre was the chairman of the evening. The E. Ingraham Company's new picture "Clocks and Watches, How They Are Made" was shown and the chairman cheerfully answered all questions regarding detail of operations. Certainly this picture was a fine example of what can be accomplished in an industrial plant and Edward Wheeler, author, photographer, and camera man of the picture should be congratulated for his fine work. Another short picture "On to Mars" by the General Motors Co. was shown with much interest.

The new officers for 1941-1942 were installed at this meeting. Carsten Kohrs, of the Union Hardware Co. of Torrington as president, Librarian Kenneth Bellinger as well as the present

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A 100% Bakelite Coating. Unequalled for protection of Bonderizing or Processing Tanks. Lengthens the life of any surface—Wood, Metal, Cement, Brick, Composition, Linoleum, Stone, Rubber, Concrete, Canvas.

Ceilcote Brush Coating . . .

A Standard of Protection against corrosion, electrolysis, acids, alkali, fumes, gases, vapors and all weather conditions.

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750 ROCKEFELLER BLDG. CLEVELAND, OHIO

Used Buffs for Sale

64-68—1⅛" arbor—20 ply

Full Disc - Loose - or Sewed

Thousands of every size

8"—8¢ each 9"—9¢ each

10"—12¢ each

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4054 Beaufait Ave. Detroit, Mich.

Zialite

Reg. U.S. Pat. Off.

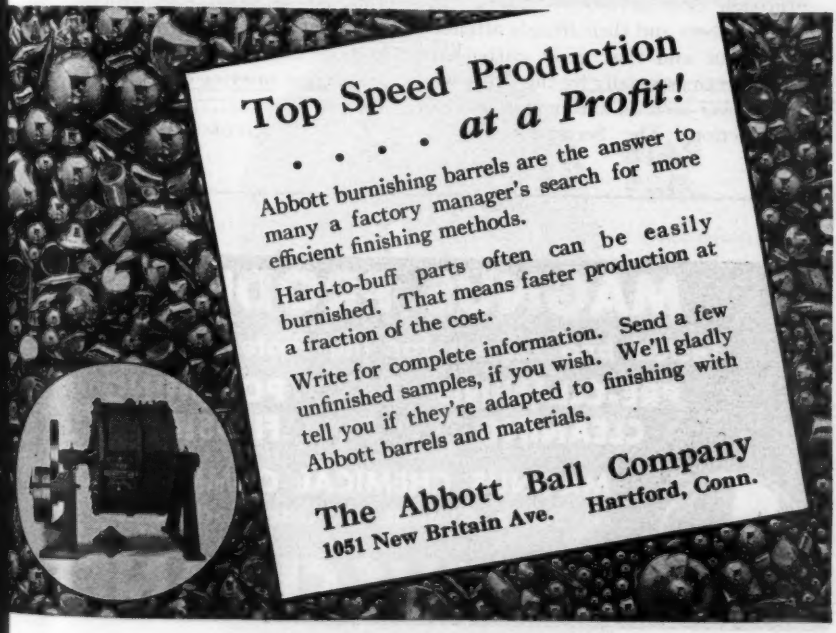
Nickel Plating Solution

The one bath especially designed for plating WHITE METAL ALLOYS including ZINC, LEAD and ALUMINUM.

Never any black streaks.

Extremely high throwing power.

ZIALITE CORPORATION
143 Exchange Street
WORCESTER, MASS.


Top Speed Production
. . . . at a Profit!
Abbott burnishing barrels are the answer to many a factory manager's search for more efficient finishing methods.
Hard-to-buff parts often can be easily burnished. That means faster production at a fraction of the cost.
Write for complete information. Send a few unfinished samples, if you wish. We'll gladly tell you if they're adapted to finishing with Abbott barrels and materials.
The Abbott Ball Company
1051 New Britain Ave. Hartford, Conn.

Secy.-Treas., A. N. Austin, were installed for another year. Our new Board of Managers consists of W. Blankenburg, Alexander Christie and Geo. Vibberts, Jr. J. H. Donahue of the Abbott Ball Co. was installed as vice-president.

At a previous business meeting it was voted to suspend payment of dues for any member drafted or enlisting in the service of Uncle Sam.

APLEY N. AUSTIN, *Secy.*

Newark Branch held its regular meeting on Friday evening June 6 at the Club Room of the Hotel Douglas. The meeting was called to order at 8:45 P. M. with President William T. Maguire presiding. All other officers were present.

An application for Anthony Di Nardo to Associate Membership was voted to take the regular course.

Our president reported on the trip through General Motors stating that 87 members and their friends attended this tour and that great enthusiasm was shown especially by the ladies who had never seen an automobile plant in production. The Secretary was instructed to write a letter of thanks to General Motors for the courtesies extended to our group on this trip.

Mr. Stanley Harris who was recently transferred to Detroit from Newark Branch attended this meeting and was called upon for a few remarks. Mr. Harris said that he still considered himself a member of Newark Branch and expressed his desire to attend all of our social functions.

Mr. Louis Donroe, our Librarian, gave us an outline of his contemplated program for the fall and winter months of 1941 and 1942. The branch heartily approved this program and he was instructed to make all arrangements for same with his committee.

Mr. Horace Smith conducted the installation of the re-elected officers in a very appropriate manner.

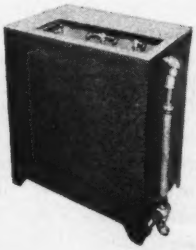
The question of meetings for the summer months was brought up and it was voted that the second meeting in June be dispensed with and that only one meeting be held in July on the 18th and one meeting in August on the 15th at our new meeting quarters, the Hotel Robert Treat.

GEORGE WAGNER, *Secy.*

MAGNUS PRODUCTS
Tested and Proven for the Plater's Needs in
PRE-CLEANING POLISHING
CLEANING FINISHING
MAGNUS CHEMICAL COMPANY
41 South Avenue Garwood, N. J.

Magnus CLEANERS

METALWASH *Motorized* Washing Machines AND Rinse Tanks



Specially designed for job shops and plant inter-departmental use.

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Foot controlled Rinse Spray Unit for direct connection to water supply.

Carefully designed spray rinse pattern assures perfect rinsing.

Inexpensive Power Alkali Spray Washer for racked parts.

Low operating costs.

METALWASH MACHINERY CO., Inc.
27-29 Haynes Avenue Newark, N. J.

BIAS Buffs

-meet an exact high quality standard in cloth and construction.

This standard has never been lowered. It has stood for 20 years and explains, to some degree, why the demand for BIAS Buffs never diminishes.

Try them.

The BIAS BUFF *and* WHEEL CO., Inc.
430 Communipaw Ave.
Jersey City, N. J.

BIAS Buffs

representatives will be glad to discuss buffing or finishing questions with you any time.

. BIAS Buff men have the answers to buff problems.

Talk yours over with our men.

Boston Branch met in their final meeting until the fall, Thursday, June 19 at the Statler Hotel with President Jones in the chair. A communication was read from the resolutions committee of the A.E.S. extending their thanks and congratulations for a successful convention. Boston branch thanks them for this very fine thought.

Four applications and two for reinstatement were read and elected to membership. A motion was made that a committee of one be appointed to arrange for a supper for the members before the meetings in the future, cards to be enclosed with the meeting notice so that arrangements can be made at the hotel. Joe Barron will be the chairman and his phone number will be on the card.

A motion was made that a letter be sent to the supreme secretary Mr. Kennedy, to be published in the MONTHLY REVIEW thanking all the members and friends for their interest in making the 1941 convention the greatest ever held.

A motion was made that Joe Barron and Arthur Mintie be appointed to make arrangements for an outing to be held at the Adams estate at Annisquam, Mass. sometime in September, the members will hear more about this from the committee.

President Jones extended his congratulations to all the members, the different committees, and the ladies for the very fine work they accomplished in making the past convention the greatest ever held. He also thanked the members for their support the past year.

Boston branch has voted to carry all members called into the services of our country. The branch has two, John C. Rich, and Allyn D. Chabot.

The officers elected for the coming year were as follows: president, William Jones; vice-president, Louis Tosi; second vice-president in charge of the membership committee, George P. Swift; secretary-treasurer, Andrew W. Garrett; librarian, Louis V. Gagnon; board of managers, Edward C. DeLorme, chairman, Harry J. Lack, and Bert W. Sage; sergeant-at-arms, George A. DeLorme.

All the officers were installed by past

PERMAG
Cleaning Compounds

PERMAG not only cuts costs, but it cleans 100 per cent efficiently and works fast without waste of time or material.

If you have a problem in your metal cleaning, Magnuson Research Service will help you solve it. Write us. No obligation.

MAGNUSON PRODUCTS CORPORATION
Main Office and Factory, Third & Hoyt Sts., Brooklyn, N. Y.

Representatives also Warehouses in Principal Cities of U. S.
In Canada: Canadian PERMAG Products Ltd. Montreal and Toronto

A NEW
QUINHYDRONE pH METER

Made especially for the electroplater

Check these improvements:

- No wires
- Compact and portable
- Rugged meters
- Direct reading
- No calomel half cell to foul
- No standard cell to replace
- Extremely simple operation—Fool proof
- Economical to buy and operate

KOCOUR CO. 4725 S. Christiana Ave., Chicago

President Charles O. Hardy and he congratulated them and wished them all success the coming year. Boston branch will meet again the first Thursday of October.

A. W. GARRETT, *Secy.*

Chicago Branch held its regular monthly meeting June 21 at the Atlantic Hotel with President C. Kelly presiding, and all other officers present. Mr. J. Mintz was appointed as sergeant-at-arms for the coming year.

Mr. F. J. Hanlon made a fine and complete report on the Boston Convention. Mr. M. H. Longfield reported on the Educational session papers, and Mr. R. Hazucha reported on the Exhibits. Gus Jelinek sure did a nice job on mounting these exhibits on the display panels, and Chicago Branch won the first prize for the Exhibits. The entire committee deserve a lot of thanks for the way they worked on this exhibit.

Mr. H. A. Gilbertson was appointed as Chairman of the Banquet committee.

Mr. Kelly appointed Mr. O. E. Servis, F. J. Hanlon, and H. A. Gilbertson as a condolence committee to write a letter of condolence to the family of Mr. E. Bernhardt.

The applications of Mr. J. C. Lockerbie, J. A. Garz, W. L. Lopatka were read and committees appointed on same.

A motion was made and seconded that any Chicago branch members going into the service would be carried without payment of dues during these trying times. J. W. HANLON, *Secy.*

Los Angeles Branch. The last regular meeting before our regular summer vacation was called to order by President Bedwell.

A letter from the Los Angeles Chamber of Commerce in answer to the efforts of Messrs. Rynkofs and Rushton to obtain some encouragement in our endeavor to bring the 1943 A.E.S. convention to Los Angeles was read. The Branch extended its thanks to Mr. Rynkofs and Mr. Rushton for their work.

Mr. McLaren, chairman of the picnic committee, reported that he had obtained a reservation at Montebello Park for a branch picnic to be held July 20, 1941. He also requested the following members to assist him as committeemen: B. Schindler, E. Coffin, S. Rynkofs, E. Holman, E. Frauenhoff, D. Bedwell, C. Thornton, R. Vasquez, D. Eldered, J. ApRoberts, E. Richardson, M. Cahoe, and O. Johnson. It was moved that $50.00 be appropriated for the expenses of the Picnic.

It was announced that one of our members is looking for a position as a plater.

Mr. W. J. Peters, who has transferred to Los Angeles from New Haven Branch was introduced. Mr. J. Wiseman, who intends to transfer to Los Angeles from Grand Rapids Branch was also introduced as was Mr. G. Scott who was present as a guest.

Mr. Bruno Schindler suggested that it would be fitting and proper for the Branch to promote a ladies auxiliary for the wives of the members. The suggestion was very favorably received and Mr. Schindler and Mr. McLaren, who are without doubt the best qualified men in the branch by reason of their extensive experience with the ladies, were detailed to take charge of this enterprise.

Mr. E. R. Holman, the librarian, then introduced Mr. Manuel Sanz, Process Engineer of Vultee Aircraft Corporation.

Mr. Sanz presented a paper "A Method for the Analysis of Chromic

OUR LABORATORIES

Always at your Service

Are you faced from time to time with plating "problems" you cannot solve in your organization? If so, you are always welcome to consult our technical staff of trained electrochemists and engineers who will cooperate with you to the fullest extent.

We maintain fully equipped laboratories for not only research and control, but also for "trouble-shooting" to help our friends. In the plating division, we operate complete equipment for experimental plating before finishing. In the analytical laboratory, we are equipped to analyze and control all types of plating solutions. Call us if you ever get into "trouble."

SEYMOUR

NICKEL ANODES · BRIGHT NICKEL

THE RUFERT CHEMICAL CO.

DIVISION OF

THE SEYMOUR MANUFACTURING CO., SEYMOUR, CONN.

Acid Baths Used for the Anodizing or Chromatizing of Aluminum or its Alloys." In his paper Mr. Sanz brought out the importance of testing these solutions not only for their free chromic acid content but also for the contaminating alumina, and he also made a number of suggestions in the interest of more efficient operation. Mr. Sanz's paper was one of the most interesting we have had and we are accustomed to interesting papers.

ERVIN FRAUENHOFF, *Secy.*

THE QUESTION BOX

Toronto Branch

1. *What is a good formula for black on brass by the dip method?*

Ans. See "Platers Guide" 1937 and 1938.

2. *Does freezing of sol. precipitate sodium carbonate into white crystals?*

Ans. Depends entirely on temperature.

3. *Is current essential in the stripping of chrome?*

Ans. Not necessary.

4. *Is there any special method used to copper plate aluminum?*

Ans. Copperplating aluminum direct is not recommended. Try plating with zinc first, then copper after.

JAMES S. CAIRNS

Chicago Branch

1. *What temperature, metal content, and acid ratio should be used for hard chrome plating?*

Ans. 140° temperature, 34 oz. chrome acid, 90 to 100 acid ratio.

2. *What is a good nickel strike to be used prior to bright nickel plating? The adhesion is very poor at present.*

Ans. It was suggested that the cleaning and acid etch be checked as it was thought that they were the fault of the poor adhesion.

3. *What is a good formula for hard chrome plating on steel?*

Ans. 32 oz. Chrome acid, 100 to one acid ratio, 4 amp. per sq. foot, 140° Temp.

4. *Will either decorative or hard chrome plating on swedish clock spring steel cause the metal to become embrittled and how will heating overcome it?*

Ans. Heat at least 2 to 4 hours at about 400°. J. W. HANLON, *Secy.*

Los Angeles Branch

1. *Why is it necessary to have 12" clearance between anode and cathode in sulphuric acid anodizing?*

Ans. To prevent burning of work.

2. *Is the use of barium-carbonate to to eliminate excess sulphuric acid in a chrome solution (plating) considered good practice and if so how is the sediment removed?*

Ans. Yes, it is satisfactory. Scrape sediment out with a shovel or hoe.

3. *How can chrome or nickel be stripped from copper sheets so that the sheets may be used for anodes?*

Ans. Strip the chrome in a caustic solution and the nickel in a sulphuric acid strip.

4. *How may a good flat smut effect be obtained on gold?*

Ans. Add lead cyanide for Egyptian gold.

5. *What is a good brightener for a cold nickel solution for barrel plating?*

Ans. Add some cadmium or saccharine; avoid an excess.

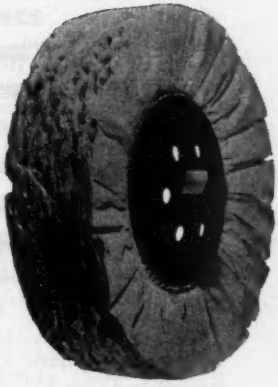
ERVIN FRAUENHOFF, *Secy.*

TO SAVE 50% ON YOUR COTTON BUFF WHEEL COSTS

USE AIRWAY *Ventilated* BUFFS

IMPORTANT AIRWAY FEATURES

1. **Faster cutting and does not ridge the work.**
2. **Eliminates burning.**
3. **Raveling eliminated, requires no raking.**
4. **Saves compound.**



YEARS TWICE AS LONG **COSTS HALF AS MUCH**

JACKSON BUFF CORPORATION

21-03 41st AVENUE LONG ISLAND CITY, N.Y.

Membership Report

ELLSWORTH T. CANDEE, *Chairman, Membership Committee*

To June 1, 1941

ELECTIONS

Baltimore-Washington Branch

Harry F. Borleis, 316 N. Holliday St., Baltimore, Md. Active
Roy E. Cole, 906 K St., S. E., Washington, D. C. Associate
Hume F. Molter, 6 Belle Grove Rd., Catonsville, Md. Active
Gilman L. Parater, Jr., R. F. D. #5, Anacostis Sta., D. C. Active

Binghamton-Syracuse Branch

Josh R. Phillips, 122 Franklin Ave., Solvay, N. Y. Active

Boston Branch

Mortimer C. Bloom, Mass. Inst. of Technology, Cambridge, Mass. Associate
Robert K. Jackson, 28 Marion Rd., Belmont, Mass. Associate
William L. Meade, 28 Adams St., Charlestown, Mass. Associate
Samuel Milligan, Washington Mills Abrasives Co., N. Grafton, Mass. Associate

Bridgeport Branch

Anthony John Chenis, Bullard Co., Bridgeport, Conn. Associate
Joseph G. Coppola, 19 Central St., Belltown, Stamford, Conn. Associate
Samuel Gordon, 4 Delaware St., Norwalk, Conn. Active
Charles Nagot, 16 Harrison Ave., New Canaan, Conn. Active
Andrew Pochna, 31 Hall St., Stamford, Conn. Associate
Robert R. Sherwood, Hope St., Springdale, Conn. Active

Buffalo Branch

F. H. Schlott, Cedar Bay, Port Colborne, Ont., Can. Associate

Chicago Branch

Edward Curran, 1507 N. Kedvale Ave., Chicago, Ill. Active
Glen Moore, 314 Cloud St., Michigan City, Ind. Active
Elmer Brewer, % A. Schwinn & Co., 1718 N. Kildare Ave., Chicago, Ill. Associate
Thomas A. Murphy, 337 Highwood Ave., Highwood, Ill. Active
William H. Murphy, 315 W. Hubbard St., Chicago, Ill. Associate
Burton L. Price, 4367 Oakenwald Ave., Chicago, Ill. Active
Frank J. Wasil, 1808 S. Michigan Ave., Chicago, Ill. Associate
Arnold C. Zameit, 336 N. Pine Ave., Chicago, Ill. Associate

Cleveland Branch

John McNulty, 666 East 140th St., Cleveland, Ohio Active

Detroit Branch

James Boyd, 1028 Waterman, Detroit, Mich. Active
Richard Flanigan, Bruce Products, 5712 12th St., Detroit, Mich. Associate
Edward Pilkarski, 5857 Trenton St., Detroit, Mich. Associate
Joe R. Wagner, 1249 Holden, Detroit, Mich. Active

Grand Rapids Branch

Raymond F. Ledford, Kalamazoo Plating Works, Kalamazoo, Mich.

Hartford Branch

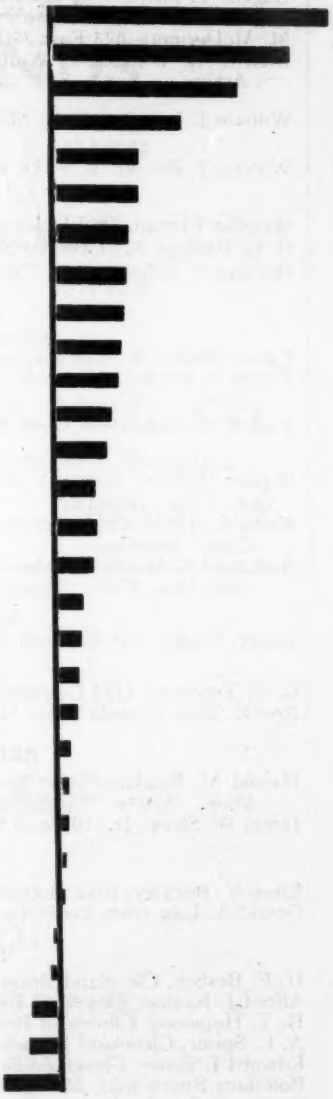
Gabriel Giamattasio, 56 French St., Torrington, Conn.

Indianapolis Branch

James Hendrickson, 5862 Sunset Lane, Indianapolis, Ind. Active

MEMBERSHIP REPORT MAY 1st, 1941

BRANCH	May 1, 1940	Change in Membership	Percent Change
1 Los Angeles	59	+62	+105.1
2 San Francisco	20	+18	+90.0
3 Lancaster	25	+17½	+70.0
4 Grand Rapids	52	+26	+50.0
5 Waterbury	66	+21½	+32.6
6 Springfield	51	+16½	+32.4
7 Cincinnati	41	+16½	+28.1
8 Dayton	62	+16½	+26.6
9 Boston	80	+21	+26.3
10 Montreal	23	+6	+26.1
11 Pittsburgh	34	+8½	+25.0
12 Rochester	62	+13½	+21.7
13 New York	102	+19	+18.6
14 Cleveland	70	+10½	+15.0
15 Toledo	40	+6	+15 0
16 Philadelphia	133	+18½	+13.9
17 Milwaukee	84	+8	+9.5
18 Hartford	45	+4	+8 9
19 Newark	125	+10½	+8.0
20 Anderson	38	+3	+7 9
21 Detroit	250	+9	+3.6
22 Chicago	225	+7½	+3.3
23 St. Louis	77	+2	+2.6
24 Bing.-Syracuse	22	+½	+2.3
25 Bridgeport	71	+1	+1.4
26 Prov.-Attleboro	38	—½	—1.3
27 Toronto	67	—1½	—2.2
28 New Haven	119	—13	—10.8
29 Baltimore-Wash.	49	—5½	—11.2
30 Buffalo	57	—12	—21.1



MEMBERSHIP — May 1st, 1940 = 2187
MEMBERSHIP — April 1st, 1941 = 2525
GAIN IN MEMBERSHIP 338
GAIN = 15.4%

NOTE: Honorary members are included with each Branch.

Los Angeles Branch

Arlie E. Morgan, 3156 Pyrites St., Los Angeles, Calif. Active
Lynn Reynolds, 10777 Van Owen St., Burbank, Cal. Associate
Eugene T. Bates, 1731 S. Menlo Ave., Los Angeles, Cal. Active
Reginald Facer, 108 Prince's Highway, Arncliffe, N.S.W., Australia. Assoc.
M. McDermott, 623 East 29th St., Los Angeles, Calif. Active
Glen S. R. Walker, 47 Wallangra Rd., Dover Heights, N.S.W., Australia. Active

Milwaukee Branch

William J. Lawrie, 329 N. Milwaukee St., Milwaukee, Wis. Associate

New Haven Branch

William J. Bercier, R. F. D. #2, Cook Rd., Prospect, Conn. Associate

Toledo Branch

Wendlin Ehman, 1861 Oakwood Ave., Toledo, O. Active
R. G. Phillips, 818 Greenler St., Defiance, O. Associate
Herman A. Sidenstecker, Toledo, O. Active

APPLICATIONS

Baltimore-Washington Branch

Calvin Baker, 59 Michigan Ave., N.E., Washington, D.C. Associate
Ernest E. Strobel, 4406 N.H. Ave., N.W., Washington D.C. Associate

Bridgeport Branch

Paul B. Krouse, 1938 North Ave., Bridgeport, Conn. Associate

Montreal Branch

Walter William Gerth, Y.M.C.A. Drummond St., Room 6067, Montreal, Que., Can. Associate
Keith R. Lane, Union Screen Plate Co. of Canada Ltd., Lennoxville, Que., Can. Associate
Archibald S. Mitchell, Union Screen and Plate Co. of Canada, Ltd., Lennoxville, Que., Can. Associate

Rochester Branch

Joseph Wesley, 161 Elmcroft Rd., Rochester, N. Y. Associate

Toronto Branch

G. E. Trueman, 1177 Lakeshore Rd., Long Branch, Ont. Associate
Roy E. Bast, Canada Skate Mfg. Co., Kitchener, Ont. Active

REINSTATEMENTS

Harold M. Brigham, Rust Proofing and Metal Finishing Corp., Cambridge, Mass. Active
James W. Shaw, Jr., 10 Pearl St., Taunton, Mass. Active

TRANSFERS

Elton V. Buckley, from Boston to Bridgeport Branch
Gerald A. Lux, from Rochester to Baltimore-Washington Branch

SUSPENSIONS

H. E. Beshey, Cleveland Branch
Alfred J. Krause, Cleveland Branch
H. T. Hopwood, Cleveland Branch
A. L. Spiser, Cleveland Branch
Edward J. Esner, Cleveland Branch
Boleslaus Buczwinski, Milwaukee Branch
George C. Arnold, Newark Branch
Frank T. Mann, Newark Branch
Irving McCaffery, Newark Branch
John Deamico, Bridgeport Branch

PEERLESS COMPOUNDS

RADIANT WHITE FINISH
PEERLESS TRIPOLI
PEERLESS WHITE STAR
PEERLESS EMERY CAKE

MANUFACTURED BY

GEORGE A. STUTZ MFG. CO.

Plating and Polishing Equipment and Supplies

1645 CARROLL AVENUE CHICAGO, ILL.

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McKEON'S

TWO PURPOSE

"Liquid Sulphur"

TRADE MARK REG.

For

OXIDIZING

AND

STRIPPING COPPER

Special Directions — FREE

SULPHUR PRODUCTS CO.

Greensburg, Pa.

RESIGNATIONS

R. M. Stutzman, Los Angeles Branch
H. H. Reama, Baltimore-Washington Branch
R. S. Gregg, Baltimore-Washington Branch
John W. Himes, Philadelphia Branch

DEATHS

John Mahaffy, 7315 Lawndale St., Fox Chase, Philadelphia, Pa.
William P. North, 27 Hawkins St., Waterbury, Conn.

BRIGHT COPPER PLATING PROCESS

A new bright copper plating process has been developed by Dr. Louis Weisberg, 71 West 45th St., New York, N. Y.

Due to the shortage of nickel, many concerns are thinking seriously of going over to heavy copper deposits followed by comparatively light nickel deposits as a means of saving nickel. For that reason, bright heavy copper deposits will be very advantageous at this time.

Following is a brief summary of the salient facts about this process.

1. The basic ingredients of the solution are copper sulphate, diethylene triamine and ammonium sulphate.
2. The copper is in the bivalent form.
3. The current efficiency at both anode and cathode is practically 100%.
4. The throwing power compares favorably with a cyanide copper solution and is much better than an acid copper solution.
5. The average current density is about 40 amperes per square foot for optimum brightness.
6. The bright plating range extends from practically zero on the one hand up to over 100 amperes per square foot on certain simple types of work.
7. A moving cathode is recommended.
8. Anodes are preferably of electrolytic copper (cathode) although cast copper anodes may be and have been used.
9. Operating temperature is approximately 140°F.
10. Rubber lined equipment—tank and filter are required.
11. Regular filtration is necessary to keep the solution clean.
12. Heating can be provided by means of a copper coil or a Duriron heat exchanger.
13. A cyanide copper flash before plating on zinc or steel is required. This need not be more than a two or three minute flash, except possibly on pieces carrying heavy scale such as bumpers where about 0.0001″ of cyanide copper is recommended. Either a Rochelle salt solution or an ordinary cyanide copper solution may be used for the flashing.

The Hanson-Van Winkle-Munning Co., Matawan, N. J., is the sole selling agent for this process.

DARCO

wets easily, too!

It doesn't take long for a 12-year-old to submerge in a swimming hole.

Darco* S-51 wets quickly too—in electroplating solutions. This activated carbon (specially made for electroplaters) never forms a fluffy, dry blanket on the surface when being made into a slurry. It mixes easily—without bother or inconvenience.

And once in use, Darco immediately adsorbs grease, oil, soaps, colloidal impurities, and troublesome disintegration products—the "ghosts" that spoil so many a plating job.

A post card will bring you a liberal sample of Darco S-51. Or, get a supply from your jobber. A little over a dime a week buys enough to keep 100 gallons clean and ghost-free.

*Darco—Reg. U. S. Pat. Off.

DARCO

This trade-mark identifies the genuine. Accept no packages without it.

DARCO CORPORATION
60 East 42nd Street
New York, N. Y.

MEMBERSHIP REPORT
1940 - 1941

BRANCHES	May 1, 1940	Elections	Reinstatements	Gains by Transfer	Loss by Transfer	Suspensions	Resignations	Deaths	May 1, 1941
Anderson	38	5			2		1		40
Balt.-Washington	49	1	1		1	3	3	1	43
Binghamton-Syracuse	22	2			1		1		22
Boston	80	19	3	4	2	1	1		102
Bridgeport	71	11		2	2	4	5	1	72
Buffalo	57	1			2	11		1	44
Chicago	225	19	2	4	1	8	5	2	234
Cincinnati	41	11		1					53
Cleveland	70	18		1	2	5	2		80
Dayton	62	17		1				1	79
Detroit	250	33		5	3	9	14	2	260
Grand Rapids	52	29			2		1	1	77
Hartford	45	7			2		1	1	48
Indianapolis		37		2					39
Lancaster	25	17		3			1		44
Los Angeles	59	59	4			1			121
Milwaukee	84	11				3			92
Montreal	23	8					2		29
Newark	125	15	3	2	1	5	2	1	136
New Haven	119	21			4	28	8		100
New York	102	21	4	1	1	4	1	1	121
Philadelphia	133	22			3	2			150
Pittsburgh	34	11	1	1			2	2	43
Providence-Attleboro	38	1		1	2			1	37
Rochester	62	15		1		1		1	76
San Francisco	20	19				1			38
Springfield	51	14	2	3		1			69
St. Louis	77	6				2		2	79
Toledo	40	7	1		1	2	1		44
Toronto	67	7	1	1		6	3	1	66
Waterbury	66	21	1	2	3				87
	2187	485	23	35	35	97	54	19	2525

VIEW

May 1, 1941

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